UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

February 16, 2000

James M. Seif
Secretary
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
Harrisburg, PA 17105-8464

Dear Secretary Seif:

The purpose of this letter is document the United States Environmental Protection Agency's (EPA) understanding of the Commonwealth of Pennsylvania's enforceable commitment made in its State Implementation Plan (SIP) revision submittal dated July 31, 1998. On December 16, 1999 EPA published a Notice of Proposed Rulemaking (NPR) on the One-Hour Ozone Attainment Demonstration for the Philadelphia-Wilmington-Trenton Area, (64 Fed. Reg. 46325) which called for the Commonwealth to reaffirm its previous enforceable commitment to adopt additional control measures to meet the level of reductions that EPA has identified as necessary for attainment.

The July 31, 1998 SIP revision states that:

> Pennsylvania commits to the development and implementation of control measures and requirements in accordance with the process provided in the APCA and other applicable laws that, along with reductions in transport, will result in reductions necessary for satisfaction of reasonable further progress requirements and attainment of the one hour ozone standard. (emphasis provided)

EPA interprets the words "other applicable laws" to include the Clean Air Act (CAA), 42 U.S.C. §§ 7401-7671q and its implementing rules and regulations. Therefore, EPA interprets Pennsylvania's commitment to mean that if EPA determines, after notice and comment rulemaking pursuant to the Clean Air Act, that additional reductions in emissions are necessary in order to demonstrate attainment, Pennsylvania will adopt additional control measures to meet the level of reductions that EPA has identified as necessary for attainment. Pennsylvania retains any rights and remedies it may have to challenge any final EPA action.

EPA understands that Pennsylvania intends to submit a letter reaffirming its July 31, 1998 enforceable commitment. If Pennsylvania disagrees with EPA's interpretation of the July 31, 1998 SIP revision commitment please provide us with a written explanation.

EPA Region III looks forward to resolving these issues in an expedited manner. If you have any questions please do not hesitate to contact me, or have your staff contact Cecil Rodrigues, Senior Assistant Regional Counsel, at 215-814-2683.

Sincerely,

Judith Katz, Director
Air Protection Division

cc: James M. Salvaggio (PADEP)
Lydia Wegman (OAQPS)

Pennsylvania Department of Environmental Protection

Rachel Carson State Office Building
P.O. Box 2063
Harrisburg, PA 17105-2063

February 25, 2000

The Secretary

717-787-2814

[redacted]

FEB 2 9 2000

[redacted]

Bradley M. Campbell
Regional Administrator
U.S. EPA, Region III
Mail Code 3RA00
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Brad:

This letter is in response to the federal Environmental Protection Agency's (EPA) Notice of Proposed Rulemaking (NPR) on the one-hour attainment demonstration for the Philadelphia-Wilmington-Trenton Area that was published in the Federal Register on December 16, 1999 (64 FR 70428) and the Notice of Adequacy Status that was published in the Federal Register on January 20, 2000 (65 F.R. 3230).

The Department is reaffirming our commitment to:

a) continue to participate in a consultative process to address regional transport;

b) continue to identify emission reductions needed from upwind states; and

c) the development and implementation of control measures and requirements in accordance with the process provided in the Pennsylvania Air Pollution Control Act (APCA) and other applicable laws that, along with reductions in pollutant transport, will result in reductions necessary for satisfaction of reasonable further progress requirements and attainment of the ozone one-hour standard.

These commitments are contained in Pennsylvania's August 1, 1998 State Implementation Plan (SIP) revision that EPA proposed to approve on August 25, 1999 (64 F.R. 46325). The Department has done and will continue to do what is necessary to protect the health of our citizens.

Improvement in the air quality of the nonattainment area can only occur, in part, by close cooperation among the states and the Environmental Protection Agency. The Department will continue to work closely with our neighbors, the Ozone Transport Commission and EPA to identify additional measures to solve our common air pollution problems and to determine the extent to which additional reductions are necessary in Pennsylvania. Specific additional control measures are described in more detail in the "Pennsylvania Fair Share Commitment" attached.

These additional measures do not include any measures that would limit highway construction. Please note that Pennsylvania is not committing to adopt any specific measure at this time.

In accordance with the process contained in the Pennsylvania Air Pollution Control Act, Pennsylvania will submit any necessary draft and final measures to EPA as soon as possible, and by October 31, 2001. As you know, Pennsylvania's regulatory process is complex and meeting the October 31, 2001 date will be challenging for any necessary measures beyond those contained in proposed Chapter 145. Pennsylvania is scheduled to promulgate the Chapter 145 Interstate Pollution Transport Reduction regulation this summer. In addition, because regular review is an important part of any planning process, Pennsylvania will submit to EPA such mid-course review as the Clean Air Act and the rules and regulations under the Clean Air Act require by December 31, 2003.

Pennsylvania also recognizes that the modeling tools are continuing to improve. EPA is developing Mobile 6, an improved model for estimating emission reductions from mobile sources. Pennsylvania will use that improved tool as required by the Clean Air Act and the rules and regulations under the Clean Air Act, to model the conformity budget for the Philadelphia attainment area.

Should you have any questions regarding this letter, please contact James M. Salvaggio, Director, Bureau of Air Quality, at 717-787-9702.

Sincerely,

James M. Seif
Secretary

Enclosures

PENNSYLVANIA'S FAIR SHARE COMMITMENT

Pennsylvania has done and will continue to do its fair share to address ozone pollution. Pennsylvania has made a commitment, as a part of the Philadelphia Attainment Demonstration to:

a) continue to participate in a consultative process to address regional transport;

b) continue to identify emission reductions needed from upwind states; and

c) the development and implementation of control measures and requirements in accordance with the process provided in the Pennsylvania Air Pollution Control Act (APCA) and other applicable laws that, along with reductions in transport, will result in reductions necessary for satisfaction of reasonable further progress requirement and attainment of the one-hour ozone standard.

Consultative Process

Pennsylvania was an active participant in the Ozone Transport Commission (OTC) workgroup responsible for development of regional ozone reduction measures. That group authored the NOx Memorandum of Understanding (MOU) that formed the basis for the NOx Model Rule. Pennsylvania promulgated and implemented the model NOx cap-and-trade program described in the OTC NOx MOU. Pennsylvania has also adopted the National Low Emission Vehicle (NLEV) program originally conceived as a regional strategy of the OTC.

Pennsylvania chaired the Emissions Trading Workgroup formed as a part of the Ozone Transport Assessment Group (OTAG). Recommendations from this workgroup form the basis of the NOx cap-and-trade program recommended as a part of the NOx SIP call and required as a part of the 126 remedy.

Pennsylvania has committed to continuing its active role in working with the OTC to develop a "Regional Strategy Concerning the Development of New Control Measures" to be implemented across the OTR for attainment and maintenance of the one-hour ozone standard as well as other measures that individual states could implement to meet applicable requirements.

Emission Reductions from Upwind States

On August 14, 1997, Governor Ridge filed a petition with EPA asking it to reduce air pollution coming into Pennsylvania from other states. On December 17, 1999, EPA granted Pennsylvania's petition and established a NOx cap and trade program for large sources of NOx in states that significantly contribute to nonattainment in Pennsylvania. Pennsylvania will continue to aggressively support EPA's remedy in legal challenges before the United States Court of Appeals for the District of Columbia Circuit.

Pennsylvania also supports EPA's "Finding of Significant Contribution and Rulemaking for Certain States in the OTAG Region for Purposes of Reducing Regional Transport of Ozone"

(NOx SIP call). Pennsylvania was one of the first states to develop a proposed rule to implement the NOx SIP call.

Finally, on January 22, 2000, Pennsylvania published an Advance Notice of Final Rulemaking (ANFR) proposing modifications to the Pennsylvania's proposed rule implementing the NOx SIP call (Chapter 145 Interstate Pollution Transport Reduction). That ANFR proposes to require that large NOx sources located in states that significantly contribute to nonattainment of the one-hour ozone standard in Pennsylvania participate in the NOx cap-and-trade program applicable to sources located in Pennsylvania. This proposed cap-and-trade program is consistent with the Section 126 remedy established by EPA.

Additional Control Measures

Pennsylvania has identified specific additional control measures applicable to the Philadelphia ozone nonattainment area. Some measures require local emission reductions while others address both local and regional nonattainment. Pennsylvania has committed to doing its fair share to assure that the Philadelphia-Wilmington-Trenton nonattainment area and the entire Northeastern United States achieve the one-hour ozone standard by the attainment dates established by the Clean Air Act.

Chapter 145 Interstate Pollution Transport Reduction

As part of the Philadelphia Attainment Plan, Pennsylvania has committed to implementation of the NOx transport reductions. As described above, Pennsylvania has recently released an ANFR package to implement the NOx reductions both in Pennsylvania and in states significantly contributing to nonattainment in Pennsylvania.

Pennsylvania recognizes that the emission reductions from sources covered by the Chapter 145 rule located in Pennsylvania are necessary to achieve and maintain the one-hour ozone standard both in Pennsylvania and in downwind states. Pennsylvania reaffirms its commitment to proceed with implementation of that regulation.

Tier II

Pennsylvania also agrees that implementation of the Tier II standards are necessary for the Philadelphia-Wilmington-Trenton nonattainment area to achieve and maintain the one-hour ozone standard. Pennsylvania will continue to support EPA's implementation of the Tier II standards.

Stakeholder Recommendations

In 1996, Governor Ridge, through the Department of Environmental Protection and the Department of Transportation, created the Southeastern Pennsylvania Ozone Stakeholders to recommend control strategies to the Commonwealth for attainment and maintenance of the ozone standard. In January 1997, the Stakeholders released their final report, which contains a

list of recommended control strategies. A copy of that report is attached. The recommended strategies focus on the following major topics and contain a list of detailed control strategies:

a) Funding Consistency;

b) Area Source Emissions;

c) Mobile Source Emissions;

d) Stationary Sources;

e) Trading Programs;

f) Voluntary Measures; and

g) Legislative Initiatives.

Pennsylvania has already implemented a number of the stakeholder recommendations and is continuing the process of implementation of those recommendations as appropriate.

OTR Reductions

As described above, Pennsylvania has committed to continuing its active role in working with the OTC to develop a "Regional Strategy Concerning the Development of New Control Measures" to be implemented across the OTR for attainment and maintenance of the one-hour ozone standard as well as other measures that individual states could implement to meet applicable requirements. The OTC MOU and draft list of control measures are attached. Pennsylvania also recognizes that if the OTC cannot reach consensus on a specific list of control strategies, individual states will need to proceed to make the necessary reductions, under Section 110(a)(2)(d), in order for the Northeastern United States to achieve the one-hour ozone standard. Pennsylvania will continue to do its fair share to achieve the ozone standard.

Additional Emission Reductions Not Modeled

Pennsylvania disagrees with EPA's conclusion that the additional emission reductions calculated using the "DRAFT – Guidance for Improving Weight of Evidence Through Identification of Additional Emission Reductions Not Modeled" are necessary for Pennsylvania to attain the one-hour ozone standard. Attachment 5 to that document is a draft guidance document developed in October of 1999. It follows the "screening test defined in the proposed Guidance 8-hour ozone modeling guidance entitled *Draft Guidance on the use of Models and Other Analysis in Attainment Demonstrations for the 8-Hour Ozone NAAQS, May 1999.*" TSD III.G. The 8-hour standard was overturned by the U.S. Circuit Court of Appeals on May 14, 1999. In addition, the 8-hour standard uses an entirely different test for determining violations and attainment.

In other words, the analysis of additional reductions needed is based on two proposed guidance documents. The screening analysis that forms the basis for the approach was developed under the now remanded 8-hour standard. Clearly, EPA cannot ignore the CAA requirement to base an attainment determination on modeling and approved analytical methods and then calculate shortfalls, not identified by that modeling and analysis, using this "back of the envelope" approach.

In addition to the obvious legal problem with EPA's approach, the analysis itself contains calculation errors, is based on data not submitted by Pennsylvania as a part of the SIP demonstration, and makes invalid assumptions.

Attainment Analysis

As described above, the CAA envisions modeling to be the primary basis for determining the adequacy of a state's attainment demonstration. Pennsylvania is committed to continuing its modeling effort to demonstrate attainment and maintenance of the one-hour standard.

To ensure that the control measures contained in the Philadelphia Attainment Plan and identified above continue to demonstrate attainment, Pennsylvania will conduct such mid-course review as the Clean Air Act and the rules and regulations under the Clean Air Act require to continue to demonstrate attainment and maintenance of the one-hour standard.

Pennsylvania also recognizes that the modeling tools are continuing to improve. EPA is developing Mobile 6, an improved model for estimating emission reductions from mobile sources. Pennsylvania will use that improved tool as required by the Clean Air Act and the rules and regulations under the Clean Air Act to model the emission budgets for the Philadelphia attainment area.

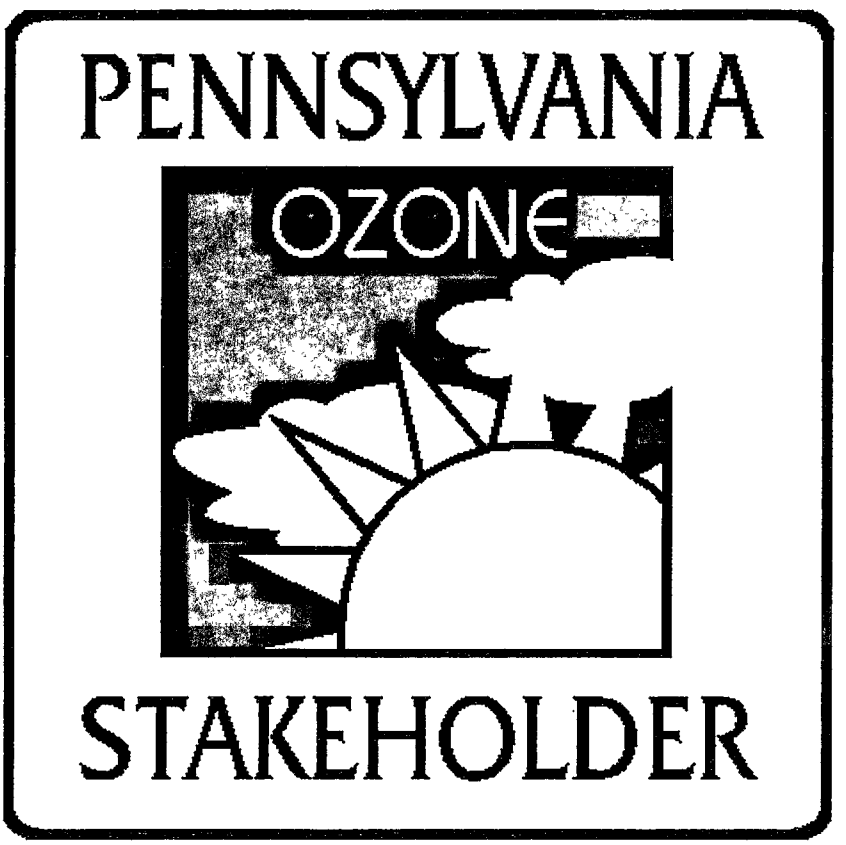
Summary

Pennsylvania reaffirms its commitments to do its fair share to assure that the one-hour ozone standard is achieved in the Philadelphia-Wilmington-Trenton nonattainment area and throughout the Northeast. Pennsylvania has committed to work with the OTR to develop additional control measures for the region; to pursue, in all forums, additional emission reductions; and to develop and implement the specific additional control strategies necessary to achieve the one-hour ozone standard.

Pennsylvania will promulgate and implement the Chapter 145 Interstate Pollution Transport Reduction Standards committed to in the Philadelphia attainment demonstration. In addition, Pennsylvania believes that the EPA Tier II standards are necessary to attain the one hour standard and will continue to support their promulgation and implementation. Finally, Pennsylvania is continuing to work toward implementation of recommendations contained in the Southeastern Stakeholders Report.

Pennsylvania will also conduct any mid course review and Mobile 6 modeling analysis required by the Clean Air Act and the rules and regulations under the Clean Air Act.

SOUTHEAST



WORKING GROUP

FINAL REPORT

January 16, 1997

Southeastern Pennsylvania Ozone Stakeholder Working Group

Final Report

January 16, 1997

Convener: Commonwealth of Pennsylvania

James M. Seif
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17105

Bradley L. Mallory
Department of Transportation
555 Walnut Street
Forum Place
Harrisburg, PA 17101

Facilitator: CDR Associates
100 Arapahoe Avenue
Boulder, CO 80302

2710-BK-DEP2071

Southeastern Pennsylvania Ozone Stakeholder Final Report

Table of Contents

Related environmental information is available electronically via Internet. Access the DEP-DCNR Web Site at http://www.dep.state.pa.us (choose Information by Environmental Subject/choose Air Management.

March 12, 1996

See Attached List

Dear _____:

We are pleased to invite you to participate in the Southeast Pennsylvania Clean Air Stakeholders Group. The Stakeholders Group will work during the next year to develop a course of action for the attainment and maintenance of the health-based ozone standard, a strategy tailored to meet the regional needs of the Philadelphia area.

We believe that new clean air strategies in areas with continuing air pollution problems should be developed from the ground up, by those with significant stakes in the outcome. The Commonwealth needs a plan that is based on good air pollution science, is equitable among air pollution sources and meets the requirements of the federal Clean Air Act Amendments. The Clean Air Stakeholders Group has been charged with this important mission. We expect the outcome of this effort to be recommendations that the Commonwealth can use as the basis for continuing to meet its clean air obligations. The group will operate by a consensus decision-making process. Areas on which there is no consensus will also be identified.

Since the sources contributing to ozone pollution and the people affected by it are diverse, the stakeholders group has to be large enough to represent these interests, yet small enough to form a group that can work together. You have been selected because of your ability to provide appropriate representation, as well as your personal qualifications and capacity to work toward consensus on a broad range of clean air issues.

The first meeting has been scheduled for April 1 and 2, 1996. Most of the time at this convening meeting will be spent on developing principles of operation for the group, identifying agenda items, and participating in a brief training session on interest-based negotiation and consensus building. The group will also develop its own meeting schedules. You will be getting a packet of materials for the first meeting in the next few days. The Commonwealth will reimburse you for your travel expenses through a procedure which will be explained at the first meeting. As you already know, the Commonwealth has engaged an independent facilitator from CDR Associates to help us achieve a common understanding of the problem and arrive at potential solutions.

Consensus is not an easy process. It takes communication, compromise, common sense and most of all, commitment. We appreciate your willingness to work with us, and we look forward to working with you in the coming months. Should you have questions in the meantime, please feel free to contact Robert Barkanic, Special Assistant; Air, Recycling and Radiation Protection, DEP, at 717-772-2725.

Sincerely,

James M. Seif
Secretary
Department of Environmental Protection

Sincerely,

Bradley L. Mallory
Secretary
Department of Transportation

January 16, 1997

The Honorable James M. Seif
Secretary
Department of Environmental Protection
P.O. Box 2063
Harrisburg, PA 17105

The Honorable Bradley L. Mallory
Secretary
Department of Transportation
555 Walnut Street
Forum Place
Harrisburg, PA 17101

Gentlemen,

The Southeastern Pennsylvania Ozone Stakeholders submit the enclosed report for your consideration. This report provides the results of our deliberations, including recommended control measures, supporting assumptions and context. In addition, we have indicated non-consensus items which we feel will require additional attention from the Commonwealth.

In accordance with the stakeholders' adopted mission statement and charge, the recommendations are based on the current health-based hourly ozone standard of .12 ppm to be achieved by the year 2005.

We look forward to your comments and your full support for our recommendations. Our deliberations were thorough and diligent; the outcome merits serious consideration. Collectively, the stakeholders stand ready to meet with you to discuss these proposals.

Sincerely yours,

Southeastern Pennsylvania Ozone Stakeholders

Chester County Health Department

Automotive Service Association of Pennsylvania

[illegible] Motors

City of Philadelphia

ASE SAE

Sea Change

Sun Company/Associated Petroleum Industries of Pennsylvania

U. S. Environmental Protection Agency

AAA Mid-Atlantic

Clean Air Council

DEP Citizens Advisory Council

Rohm and Haas

Pennsylvania Department of Transportation

Delaware County Transportation Management Association

Montgomery County Planning Commission

INTRODUCTION

Stakeholders Mission

The Governor of Pennsylvania, through the Pennsylvania Department of Environmental Protection and the Pennsylvania Department of Transportation, created the Southeastern Pennsylvania Ozone Stakeholders to recommend control strategies to the Commonwealth for attainment and maintenance of the current health-based standards and the requirements of the 1990 Federal Clean Air Act Amendments. Under the Clean Air Act Amendments, the five counties in southeastern Pennsylvania—Bucks, Chester, Delaware, Montgomery and Philadelphia—are currently classified as "severe non-attainment" for ground-level ozone. The non-attainment area also includes parts of New Jersey, Maryland and Delaware.

Ground-level ozone is a colorless, odorless gas produced when nitrogen oxides (NOx) and volatile organic compounds (VOC) react in the presence of heat and sunlight.

In accordance with the stakeholders' adopted mission statement and charge, the recommendations in this report are based on the current health-based standard of .12 ppm of ozone to be achieved by the year 2005.

The stakeholders attempted to balance emission reductions equitably among different source types—area, mobile and stationary. It is important to preserve this balance as the recommendations are implemented.

Stakeholders Process

The stakeholder effort was a public process, held in open meetings, representing a broad base of constituencies. In addition, the stakeholders made an effort to ensure that other groups and the general public were aware of the process and had an opportunity to provide us with input. The stakeholders held one public input meeting on November 7, 1996. The recommendations contained in this report are the result of long hours of deliberation and struggle. The stakeholders met for two full days each month, from April through December to discuss and, whenever possible, to find agreement on strategies that can materially improve air quality in southeastern Pennsylvania.

At the same time that the stakeholders began to deliberate, the Inspection and Maintenance (I/M) Working Group began to design the Commonwealth's decentralized inspection and maintenance program. The stakeholders worked to avoid issues associated with implementation of the inspection and maintenance program, leaving those issues to the I/M Working Group.

Stakeholders Members

The Southeastern Pennsylvania Ozone Stakeholders represent a wide range of interests from environmental and citizen groups, industry, public utilities, small business, transportation, government, and motorist and health-care organizations. Twenty-eight stakeholders were invited to participate in the stakeholders process. During the process, some invitees withdrew, and others were added by the group to maintain the group's balance.

CONSENSUS AGREEMENTS

The recommended strategies outlined in this report are based on a consensus decision-making process as outlined in the Stakeholders' Operating Agreement (See Appendix D). Consensus is an agreement built by identifying and exploring all parties' interests and drafting a recommendation that satisfies these interests to the greatest extent possible. The recommended control measures throughout this report are labeled as consensus recommendations only if all the stakeholders agree that their major interests have been taken into consideration and addressed in a satisfactory manner. This report also contains items without consensus agreements. In those cases, the control measure is described along with differing points of view.

STAKEHOLDERS EVALUATION PROCESS

The deliberations of the Southeastern Pennsylvania Ozone Stakeholders have followed two guiding principles and objectives: 1) to identify control strategies that collectively produce regional air quality that meets the current health based standard, and 2) to reflect the unique conditions of southeastern Pennsylvania. In so doing, the recommendations contained in this report seek to balance federal requirements for air quality with cost effective strategies that protect the public health and the regional economic integrity of the five county non-attainment area.

EMISSIONS ASSESSMENT

Modeling

The stakeholders reviewed Urban Airshed Modeling results as a way to test transport and boundary assumptions, examine the impact of control strategies already adopted or proposed for implementation and lay the groundwork for southeastern Pennsylvania's subsequent attainment demonstration.

The transport (movement) of ozone and its precursors, VOC and NOx, into and out of the five-county area was discussed many times during stakeholder deliberations,

including during modeling work. The impact of transport on attainment appears to be significant, particularly for NOx. The stakeholders make their recommendations in anticipation that other regions, particularly up-wind areas, will implement similar levels of control to positively impact southeastern Pennsylvania's air quality. The stakeholders recognize that the five-county area will not demonstrate attainment until downwind areas are also able to demonstrate attainment.

Stakeholders' Emissions Targets

In southeastern Pennsylvania there are a variety of different sources of both NOx and VOC. Point sources include large industries and utilities. Area sources are small emission sources. Mobile sources, both highway and off-road vehicles, are the third category of ozone forming emissions. The 1990 estimates of pollutant by source (excluding biogenic or natural emissions) are depicted below.

Pennsylvania Portion of Philadelphia Non-Attainment Area
Anthropogenic VOC Emissions by Source

Estimated Total Emissions: 612 tons per summer day
Point 24.5% Area 30.4% Mobile 45.1% (Highway 30.7%, Off-Road 14.4%)

Pennsylvania Portion of Philadelphia Non-Attainment Area
Anthropogenic NOx Emissions by Source

Estimated Total Emissions: 451 tons per summer day
Point 37.7% Area 5.1% Mobile 57.2% (Highway 35.1%, Off-Road 22.1%)

Source: Pennsylvania Department of Environmental Protection

The stakeholders spent a great deal of their time reviewing emission inventories, emission projections and other baseline information. In one such presentation, Dr. S.T. Rao from the New York State Department of Environmental Conservation, suggested that a 25% reduction in VOC and a 50% reduction in NOx from the 1990 baseline across the entire eastern United States could lead to attainment. The group agreed to use the information from Dr. Rao as the best available overriding strategy to set emission reduction targets. Because NOx and VOC emissions are not evenly distributed throughout the region, the stakeholders understand that these reduction goals must be viewed as regional in nature. Thus, they will not be achieved in Southeastern Pennsylvania alone, but over a multi-state area. The development of Pennsylvania's attainment demonstration will be coordinated with Pennsylvania's neighboring states and the Ozone Transport Commission.

Reductions from adopted and proposed control measures are projected to result in a 35% reduction of VOC emissions by the year 2005. The stakeholders recommend VOC control strategies beyond the 35% reduction from 1990 baseline. Thus, the 25%

VOC reduction target (approximately 150 tons per day) will be exceeded by as much as 100 tons .

Reductions from adopted and proposed control measures are projected to result in a 27% reduction in NOx emissions by the year 2005. The group looked for additional NOx reductions beyond the 27%. To reach 50% reduction from 1990 baseline, the stakeholders would have to identify measures that reduce approximately 105 tons of NOx per typical summer day. However, the NOx reductions were more difficult to achieve, and the stakeholders identified measures that reduced approximately 50 of the 105 tons.

Voluntary measures recommended by the stakeholders in this report could yield approximately 8 additional tons of VOC and approximately 10 additional tons of NOx.

The stakeholders recognize that the interplay between the two pollutants is uncertain. The additional reduction in VOC emissions will result in benefits to local air quality as well as benefits to the more regional ozone problem.

The following table lists the recommended strategies and an estimated NOx or VOC reduction. In some cases no estimated emission reduction is listed. Those cases include:

- recommended strategies that require research to quantify (e.g. heavy-duty diesel inspection)
- recommended strategies with unresolved implementation issues (e.g. change in fuels beyond the five-county area), or
- strategies with uncertain agency commitment (e.g. 200 additional CNG buses).

Southeast Pennsylvania Ozone Stakeholders
Control Measures and Emission Reduction Estimates

Description	VOC (tpd) Reduction	VOC (tpd) Total	NOx (tpd) Reduction	NOx (tpd) Total
2005 CAA Baseline Emission Estimate		397		331
Auto and Truck Body VOC Content Limits	3.8		0	
Auto and Truck Body Refinishing	1.0		0	
Degreasing	5.9		0	
Gasoline Service Stations: Stage II Vapor Recovery Systems	1.9		0	
Lawn Care	11.2		0.7	
Additional Remote Sensing	1.2		0.6	
Heavy-Duty Diesel NOx Research				
National Low Emission Vehicle	11.5		13.5	
Alternative Fuels Programs	2.4		1.4	
Airport Emission Controls	0.2		0.07	
Fuel Changes Beyond 5-County Area				
Southeast Pennsylvania Transportation Authority				
Clean Diesel Program	0.5		2.2	
Park and Ride Lot Expansion	0.03		0.04	
Rail Headway Improvements	0.04		0.06	
Improvements to Suburban Bus Service				
CNG Buses				
Utility Boilers: Phase III of NOx MOU	0		6.4	
Industrial Boilers	0		3.5 to 4.5	
Process Heaters	0		6.8 to 8.6	
Reciprocating IC Engines	0		11.0	
Subtotal	39.7		46.3 to 49.1	

Southeast Pennsylvania Ozone Stakeholders Voluntary Measures

Description	VOC (tpd) Reduction	NO. (tpd) Reduction
Mobility Alternatives	0.08-1.76	0.1-1.94
Comprehensive Regional Ride Sharing		
Transit Chek		
Telecommuting		
Alternative Work Schedules		
Educational Programs and Ozone Action Program	4.6-5.1	7.4-7.8
School-Based Public Awareness		
We Care Programs Promotion		
Outreach and Education		
Transit Strategies		
Voluntary No Drive Days		
Voluntary No Burn Days		
Legislative Initiative		
Bicycle Promotion and Improvement		
Work/Rail/Non-work Trips		
Land Use Planning		
Promote Community Centers and Transportation Centers	1.1	1.0
Subtotal	5.8 - 8.0	8.5 - 10.7
Total	**45.5 - 47.7**	**53.9 - 58.9**

EXISTING AND ANTICIPATED CONTROL MEASURES

Existing Measures (by summer 1996)

The stakeholders assume the following strategies are required by the Clean Air Act Amendments and the Pennsylvania Air Pollution Control Act:

NOx Reasonably Available Control Technology (RACT)
VOC RACT fix-up
New Federal Motor Vehicle Emission Standards
Phase II Gasoline Volatility Reductions
Phase I Federal Reformulated Gasoline
Stage I Terminal Controls (Required at Service Stations before 1990)
Stage II Vapor Recovery—Service Stations
Improved Rule Effectiveness
VOC Controls at Hazardous Waste Treatment, Storage and Disposal Facilities

Anticipated Measures

The stakeholders assume the following strategies will be fully implemented as required by the Clean Air Act Amendments:

Highway Vehicles
- Federal Reformulated Gasoline—Phase II (5-county area)
- High-Enhanced Inspection and Maintenance (5-county area)
  - The Stakeholders assume the recommended control strategies contained in this report will include a Decentralized, High-Enhanced Vehicle Inspection and Maintenance program. A separate Inspection and Maintenance Working Group is developing recommendations for program implementation. A pilot program will be underway in early 1997.

MACT Standards—Clean Air Act Title III (National)
- Petroleum Refinery
- Printing and Publishing
- Marine Vessel Loading

National Rules/Control Technique Guidelines (National)
- Architectural and Industrial Maintenance Coatings
- Consumer Products Rule
- Autobody Refinishing

Fuel Combustors (Ozone Transport Region)
- OTC Stationary Source NOx Memorandum of Understanding (MOU)—Phase II Controls (see attached NOx MOU)

Non-Road Engines/Vehicles (National)
- Federal Emissions Standards by Engine Type

RECOMMENDED EMISSION CONTROL STRATEGIES

Introduction

The stakeholders attempted to reach consensus on a package of emission control strategies. The results of their discussion follows. Estimated emission reductions for the following control measures are listed in the table on page 8. For a list of control strategies considered by the stakeholders, refer to Appendix C.

Funding Consistency

The stakeholders agree that federal, state, regional and metropolitan planning organization (MPO) funding should be consistent with the recommendations in this document.

Area Source Emissions

Auto and Truck Body VOC Content Limits

The stakeholders recommend limiting the VOC content of auto body refinishing products to the South Coast Air Quality Management District (SCAQMD) Standard.

Auto and Truck Body Refinishing

The Pennsylvania Department of Environmental Protection should pursue improvements in the auto and truck body repair industry to address improper handling, application and disposal of products containing VOC. Most of the stakeholders support state-wide limits on the sale of paint containing VOC to auto and truck body repair shops to only those that have hazardous waste generation ID numbers, equipment to control VOC emissions and industry-funded training for employees handling and using the products.

Degreasing

The stakeholders recommend requiring the use of citric-based, water-based and other low VOC degreasers for commercial and industrial sources using VOC-containing degreasing solvents during the production, repair, maintenance or servicing of parts, products, tools, machinery, equipment or general work areas, using SCAQMD as a model. The stakeholders recommend that the control apply to all persons who store and dispose of VOC-containing materials used in degreasing. The stakeholders recommend exempting degreasing solvents with less than a 0.1 psi vapor pressure.

Gasoline Service Stations: Stage II Vapor Recovery Systems

The stakeholders recommend that service stations with vacuum assist systems be required to install pressure vacuum valves on vent lines on underground storage tanks to further reduce VOC emissions. Stations switching from a balance system to a vacuum assist system should be required to install pressure vacuum valves.

Lawn Care

The stakeholders recommend that the state ban the use of non-commercial gasoline-powered lawn mowers and other gasoline-powered lawn equipment on Ozone Action Days. Most of the stakeholders recommend extending this ban to commercial lawn services.

Mobile Source Emissions

Additional Remote Sensing (on-road emission screening)

Recognizing the role new technologies can play in reducing mobile source emissions, the stakeholders recommend expanding the enhanced inspection and maintenance (I/M) remote sensing program beyond the proposed Pennsylvania State Implementation Plan (SIP) for Inspection and Maintenance. If remote sensing identifies an automobile registered outside the I/M testing area, the Commonwealth should request voluntary correction of the emission problem.

Heavy-Duty Diesel NOx Research

The stakeholders recommend that the Commonwealth initiate a research project to determine the NOx levels from heavy-duty diesel vehicles. If the research indicates significant NOx increases (in excess of manufacturer specifications), the stakeholders recommend the Commonwealth adopt appropriate NOx standards and initiate an inspection and repair program. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

Air Quality Benefits From Existing Transportation Programs

The stakeholders recommend that the appropriate Commonwealth agencies determine the air quality value of programs such as transportation management and intelligent transportation systems (ramp metering, EZ Pass,. smart route, etc.) and gas cap replacement programs. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

National Low Emission Vehicle

The stakeholders recommend the Commonwealth implement the National Low Emission Vehicle (NLEV) because of its national focus and cost-effectiveness. In the absence of NLEV, the stakeholders recommend the Commonwealth implement the Ozone Transport Commission Low Emission Vehicle (OTC LEV).

Alternative Fuels Programs

The stakeholders support continuation and expansion of voluntary liquefied petroleum gas (LPG), compressed natural gas (CNG) and other alternative fuels programs at refueling sites, including toll roads, to encourage the use of alternative fuels. The stakeholders also recommend expanded funding of the alternative fuel incentives program at the current match level to encourage the purchase and conversion of public and commercial fleets.

Airport Emission Controls

Stakeholders recommend efforts to control emissions from shuttle buses, ground support equipment and auxiliary power units at Pennsylvania's commercial airports and major transportation points to reduce NOx and VOC emissions. While the stakeholders believe that specific measures should be left to the discretion of the individual facilities, the stakeholders strongly recommend these facilities use alternative fuels wherever possible. The stakeholders also recommend that measures be taken to restrict curbside idling at airports and other transportation hubs statewide. The Department of Environmental Protection and commercial airports should negotiate emission targets for overall emissions.

Fuel Changes Beyond 5-County Area

The stakeholders agree that a fuel change in contiguous counties (Lancaster, Berks, Lehigh and Northampton counties) would be helpful in reaching attainment. The stakeholders did not reach consensus on expanding the use of reformulated gasoline (RFG) to selected areas beyond the five county Consolidated Metropolitan Statistical Area (CMSA). During the discussion, the stakeholders considered three options:

- Federal RFG
- low reid vapor pressure (RVP) gasoline with VOC and toxics reductions equal to RFG
- a supplier option to provide low RVP gasoline or RFG, with a contingency to provide RFG if the attainment goal is not reached.

No option received consensus support, although significant support exists for each option. Those who support expanding the area for RFG cite the greater ozone reduction, the NOx reduction beginning in the year 2000, the lower than expected cost

and the secondary toxics benefit as reasons why RFG is preferable. Those who support the low RVP proposals cite the cost-effectiveness of RVP as a control measure and are concerned over the increased cost of RFG. (Given this disagreement, the emission reduction table on page 8 does not reflect an emission reduction.)

Southeast Pennsylvania Transportation Authority (SEPTA)

SEPTA is changing its operations and upgrading its equipment in ways that should improve air quality. Although these improvements are not motivated primarily by the air quality benefit, the secondary regional air quality benefit should be accounted for in the Commonwealth's SIP.

Clean Diesel
The stakeholders support SEPTA's Clean Diesel program including SEPTA's plan to purchase 400 Cleaner Diesel Icarus buses, and the potential purchase of 200 additional cleaner diesel buses. SEPTA will determine an additional bus purchase strategy in the near future; a decision is likely within the time frame of the development of Pennsylvania's Attainment SIP. (Because of uncertainty associated with the 200 buses, there is no estimated emission reduction in the table on page 8 of this report.)

Park and Ride
The stakeholders support SEPTA's short-term park and ride lot expansion on the regional rail system—approximately 4500 spaces.

Headway Improvements
The stakeholders support SEPTA's rail service headway improvements on the R7 regional rail line (up to 5 trains/hour) in conjunction with the I-95 highway reconstruction project .

Improvements to Suburban Bus Service
Stakeholders recommend that the state find ways to assist SEPTA to expand public transit to suburban Philadelphia. The stakeholders also recommend that public and private partnerships be pursued to fund these efforts. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

CNG Buses
Possible purchase of 70 to 100 CNG-fueled buses for SEPTA's Frontier Division. SEPTA will continue to review the viability of this project and will determine whether a commitment can be made within the time frame of the development of Pennsylvania's Attainment SIP. (There is no estimated emission reduction associated with this strategy in the table on page 8 of this report.)

Stationary Sources

Utility Boilers

The stakeholders support Phase III NOx reductions for utility boilers as described in the NOx MOU, if they occur state-wide (see attached NOx MOU, Appendix B). The Department of Environmental Protection should pursue implementation of fair-share reduction requirements for utility boilers throughout the Ozone Transport Assessment Group (OTAG) region.

Heaters/Boilers

The stakeholders recommend expanding emission controls to some boilers, process heaters and other combustion units not currently included in the NOx MOU. Emission reduction requirements should apply to combustion units with rated heat inputs greater than 100 mmbtu/hour heat input and less than 250 mmbtu/hour heat input. Reductions should be based on a cost-effectiveness analysis for each boiler/heater similar to RACT with a $3000/ton threshold for installation of controls. The baseline to be used in the analysis is the average of the actual post-RACT ozone season operations of the boiler/heater for the previous three years. Boilers and heaters that are already below an average of 0.2 lbs/mmbtu emissions rate during the ozone season will be exempt from further reductions.

Reciprocating Internal Combustion Engines

The stakeholders recommend NOx control technologies such as selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR) or low emission combustion technology to reduce emissions from stationary internal combustion engines to at or below 2 grams/brake horse power hour, except emergency generators, unless they are used primarily during high ozone days. Stakeholders recommend that the Department of Environmental Protection base these measures on rated engine capacity of 1000 horse power or larger. We further recommend that permit restrictions be made available to those facilities that either underutilize their engines or have special circumstances. In such cases, the permit restriction should be designed so that facilities operating under the restrictions cannot produce emissions beyond a specified level and that this level is verifiable and enforceable.

Shutdowns

The stakeholders support flexibility in how emission reductions from shutdowns are used. (There is no estimated emission reduction in the table on page 8 of this report.)

Trading Programs

By consensus, the stakeholders recommend that the state implement an emission reduction credit trading program to harness market mechanisms and to encourage innovation and competition in the private sector to achieve emission reductions.

The stakeholders support the maximum feasible innovation and flexibility in the design of any trading program, provided that the reductions are:

1) quantifiable,
2) verifiable,
3) surplus,
4) enforceable, and
5) the transaction includes a benefit for the environment.

The Commonwealth should require that protocols for generating and using emission credits support the five principles listed above and provide for the following:

- A one-time emission reduction can generate a credit only if traded for a one-time emission.
- Trading mechanisms, including inter-sector trading, should produce transactions with comparable air quality benefits.
- Any trading program should consider the seasonal effects of credit generation and use on air quality. An unresolved point in stakeholder deliberations was that trading non-ozone-season emissions for ozone-season emissions may reduce the likelihood of attainment.

The stakeholders differ over other details of a trading program:

Inter-Pollutant Trading—Some stakeholders are opposed to trading one kind of pollutant for another because they believe that differences in toxicity between different VOC should render them untradable for one another. In addition, some oppose trading NOx for VOC and recommend limiting the trading to NOx for NOx and similar VOC for similar VOC. Most believe that a vibrant market requires having flexibility to trade between different pollutants and that appropriate trading ratios can be established among different VOC and between VOC and NOx.

Geography—The location of the emission reduction and the location of the traded emissions is of concern to some stakeholders. They are concerned that businesses and residents near the facility that purchases the emission credit will be unwilling to accept a higher level of emission than would have occurred without a trading program.

Open Market Trading—The stakeholders remain in disagreement about perhaps the most fundamental question—whether the trading should occur through a hybrid system of open-market trading and a cap-and-trade program, or exclusively through a cap-and-

trade program. Most of the stakeholders support a hybrid approach. Some stakeholders support only a cap-and-trade approach.

Voluntary Measures

The stakeholders recommend voluntary emission reduction programs to augment the emission reductions from regulatory controls. The stakeholders recommend that EPA provide recognition and incentives for voluntary measures.

Energy Conservation

The stakeholders recommend that the Commonwealth promote and support energy conservation programs and work with local governments and federal agencies to encourage participation in these programs.

Mobility Alternatives

The stakeholders recommend that the Department of Environmental Protection suppor and encourage a comprehensive Mobility Alternatives Program, including the followinç elements:

- a voluntary regional ride-sharing program to encourage public transit and ride sharing including employer participation incentives,
- promotion and expansion of the *Transitchek* program to further encourage the us of regional mass transit and ride sharing,
- a telecommuting program to provide incentives to area businesses to reduc commuting traffic and
- encouragement of alternative work schedules to stagger commuter traffic on are highways.

Educational Programs

The stakeholders recommend that the Department of Environmental Protection pursu other educational programs including the following voluntary and community educatic efforts:

- a school-based program to promote knowledge of the ozone problem and t actions that lead to emission reductions,
- a business-based program to promote voluntary pollution prevention and be management-practices programs and
- a media-based program to alert the general public to days when ozone is forecast be unhealthful and to request ozone-reducing actions.

Ozone Action Program

The stakeholders recommend continuation of existing efforts to predict and announce high ozone days as part of an ozone action program and as part of other recommended control strategies that take effect on high ozone days. The stakeholders further recommend an ozone action program that will include the following elements:

- transit strategies that will encourage transit use through incentives available on ozone action days,
- promote a variety of voluntary ways to eliminate single-occupant vehicle travel on ozone action days, primarily by eliminating unnecessary automobile trips and
- encourage citizens in southeastern Pennsylvania to eliminate open burning voluntarily on ozone action days.

Bicycle Promotion and Improvements

- The stakeholders further recommend that the Commonwealth encourage the use of bicycles (or other non-motorized means of travel) as substitute for short automobile trips. In order to promote bicycle use, the Commonwealth is urged to carry out bicycle and pedestrian improvements designed to offer safe and comfortable right-of-way. The stakeholders urge the Commonwealth to develop comprehensive bicycle improvements at regional facilities, including improvements at 14 selected rail stations, and expand non-motorized programs.

Legislative Initiatives

Land Use Planning-Promote Community Centers and Transportation Centers

The stakeholders support and recommend that legislative initiatives be pursued to give county and municipal planning agencies greater powers and incentives to promote cooperative and comprehensive regional, county and local plans and coordinated implementation strategies, based on the concepts of compact community centers and transportation centers. Such centers would help to foster more concentrated development patterns, reduce unnecessary trips and facilitate choice in travel such as pedestrian, bicycle and public transit modes.

Fuel Quality

The stakeholders recommend that the Commonwealth implement a fuel quality testing program.

Funding

Funding

The stakeholders disagreed about whether to include recommendations about funding specific projects or organizations. The stakeholders discussed increasing dedicated public transit funding but did not agree to make a recommendation.

APPENDIX A

Organizations/Stakeholders Invited To Participate In The Stakeholders Process

Philadelphia Stakeholders	Representative	
Area Sources/Small Business	Mark Hammond	Graphic Arts/Printing
Area Sources	Jim Bauer	Coatings
Large Business/Employee Trips	Martha Anderson	Thomas Jefferson Hospital
Stationary Source/Economic Development	Tony Ippolito	Sun Oil
Stationary Source	Susan Verzilli	Rohm and Haas
Large Business/Mobile Sources	Ned Griffith	ARCO Chemical
Transportation Sector/Suburban County	Jill Welch	Delaware County TMA
Transportation Sector	Rich Bickel	Septa
Transportation /Small Business	David Lee	I and M Working Group
Transportation /Mobile Sources	Jack Weber	AAA
Transportation Sector	Jim Perudo	New Car Dealers
Mobile Sources/Small Business	Larry Potts	Service Stations
Health	Norm Childs	American Lung
Health/Citizen	Dr. Robin Foster-Drain	To Our Children's Future With Health
Environmental	Shirley Loveless	Pennsylvania Environmental Council
Environmental	Joe Minott	Clean Air Council
Environmental	Nancy Parks	Sierra Club
Local Government	Pat O'Neill	City of Philadelphia
Public-Private/Transportation	Peter Quinn	GVFTMA

Regional Government	Rob Roggenburk	DVRPC
State	Jim Rue	DEP
State	Fran Carlini	DEP
State	Andy Warren	DOT
State	Audrey Minor	DOT
Federal	Tom Maslany	EPA

APPENDIX B

NOx Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING AMONG THE STATES OF THE OZONE TRANSPORT COMMISSION ON DEVELOPMENT OF A REGIONAL STRATEGY CONCERNING THE CONTROL OF STATIONARY SOURCE NITROGEN OXIDE EMISSIONS

WHEREAS, the States of the Ozone Transport Commission (OTC) face a pervasive problem in their efforts to attain the National Ambient Air Quality Standard (NAAQS) for ozone; and

WHEREAS, a 1991 National Academy of Sciences study on ground-level ozone indicates that a combination of reductions in emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx) will be necessary to bring the entire Ozone Transport Region (OTR) into attainment by the statutory attainment dates; and

WHEREAS, modeling and other studies confirm that NOx emission reductions are effective in reducing ozone formation and help to reduce ozone transport; and

WHEREAS, the States of the OTC are requiring major stationary sources of NOx to implement reasonably available control technology (RACT); and

WHEREAS, by November 15, 1994, the States must submit attainment demonstrations to EPA as State Implementation Plan (SIP) revisions; and

WHEREAS, the implementation of RACT for the control of NOx emissions will not be sufficient to enable all States in the OTR to reach attainment; and

WHEREAS, the undersigned States seek to develop an effective regional program to reduce NOx emissions, which would be implemented in conjunction with other measures to control ozone precursors (including state-specific measures, regional measures and Federal measures required under the Clean Air Act); and

WHEREAS, these measures together may enable EPA to approve the States' SIPs and refrain from imposing sanctions that could restrict economic growth throughout the OTR; and

WHEREAS, information that the States have collected in their emissions inventories shows that large boilers and other large indirect heat exchangers are the source of a substantial portion of the NOx emissions in the States, and will continue to be so after they implement RACT;

WHEREAS, the States intend to complete a reevaluation of stationary source controls for 2003 and beyond in 1997, based on results of EPA-approved models and other relevant technical data;

THEREFORE, the undersigned member States hereby agree to propose regulations and/or legislation for the control of NOx emission from boilers and other indirect heat exchangers with a maximum gross heat input rate of at least 250 million BTU per hour; and

FURTHERMORE, that the States agree to propose regulations that reflect the difference in conditions in (i) the OTR's "Northern Zone" consisting of the northern portion of the OTR: (ii) the OTR's "Inner Zone" consisting of the central eastern portion of the OTR: and (iii) the OTR's "Outer Zone" consisting of the remainder of the OTR; and

FURTHERMORE, that to establish a credible emissions budget, the States agree to propose regulations that require enforceable specific reductions in NOx emissions from the actual 1990 emissions set forth in each State's 1990 inventory submitted to EPA in compliance with_'182(a) (1) of the Clean Air Act or in a similar emissions inventory prepared for each attainment area (provided that for exceptional circumstances that a more representative base year may be applied to individual sources in a manner acceptable to EPA) subject to public notice; and

FURTHERMORE. that the States agree to develop a budget in a manner acceptable to EPA based on the principles above no later than March 1, 1995; and

FURTHERMORE, if such a budget is not developed by March 1, 1995, that the 1990 interim inventory used by EPA in its Regional Oxidant Model simulations for the 1994 OTC Fall Meeting will be used for the budget; and

FURTHERMORE, that the States agree to propose regulations that require subjec sources in the Inner Zone to reduce their rate of NOx emissions by 65 percent fron base year levels by May 1, 1999, or to emit NOx at a rate no greater than 0.2 pound per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require subjec sources in the Outer Zone to reduce their rate of NOx emissions by 55 percent fror base year levels by May 1, 1999, or to emit NOx at a rate no greater than 0.2 pound per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require sources the Inner Zone and the Outer Zone to reduce their rate of NOx emissions by 75 perce from base year levels by May 1, 2003, or to emit NOx at a rate no greater than 0.' pounds per million BTU; and

FURTHERMORE, that the States agree to propose regulations that require subje sources in the Northern Zone to reduce their rate of NOx emissions by 55 percent fr base year levels by May 1, 2003, or to emit NOx at a rate no greater than 0.2 poun per million BTU; and

FURTHERMORE, that the States agree to develop a regionwide trading mechanism in consultation with EPA; and

FURTHERMORE, that in lieu of proposing the regulations described above, a State may propose regulations that achieve an equivalent reduction in stationary source NOx emissions in an equitable manner; and

FURTHERMORE, that the regulations for May 1, 2003 described above may be modified if (i) additional modeling and other scientific analysis shows that the regulations as modified together with regulations governing VOC emissions, will achieve attainment of the ozone NAAQS across the OTR, and (ii) this Memorandum of Understanding is modified to reflect those modeling results and other analysis no later than December 31, 1998; and

FURTHERMORE, that the States agree to propose regulations that are otherwise consistent with the attached recommendations of the OTC's Stationary/Area Source Committee; and

FURTHERMORE, that the undersigned States agree to request that the EPA Administrator determine whether the SIPs of States outside the OTR contain adequate provisions to prohibit the emission of air pollutants in amounts that will contribute significantly to nonattainment of a National Ambient Air Quality Standard (NAAQS) within the OTR, as required under 42 U.S.C. Section 110(a)(2)(D).

SE Pennsylvania Ozone Stakeholders Group
Control Measures Summary

Measure No.	Source Category	Control Measure	VOC			NO_x		
			2005 Emissions tpd	2005 Emission Reduction tpd	Cost Per Ton	2005 Emissions tpd	2005 Emission Reduction tpd	Cost Per Ton
Primary Control Measures Under Consideration								
1	Industrial Surface Coating	Add-on Controls or VOC Content Limits				0	N/A	
	Wood Furniture - Point	1997 SCAQMD Limits	0.3	0.1	25			
	Wood Furniture - Area	CTG Limits	2.9	1.0	1,800-5,900			
	Auto Body	none (more stringent levels were not identified)	0.4	0	0			
	Can Coating	CARB RACT/BARCT	9.0	2.2	4,000-5,000			
	Misc. Metal Parts	CARB RACT/BARCT	2.2	0.7	4,260			
	Plastic/Rubber/Glass Parts	SCAQMD Limits	0.3	0.2	1,110			
	Fabric/Paper Coating	SCAQMD Limits	23.1	5.5	4,000-5,000			
	Vinyl Coating	SCAQMD Limits	N/A	41%	4,000-5,000			
	Magnet Wire	none (more stringent levels were not identified)	N/A	0				
	Coil Coating	CARB RACT/BARCT	0.9	0.3	4,000-5,000			
	Metal Furniture/Appl.	CARB RACT/BARCT	7.5	1.5	4,000-5,000			
	Industrial Adhesives	SCAQMD Limits	0.9	0.8	800-6,800	0	N/A	
2	Surface Coating - Aerospace	Extend RACT, VOC Content Limit						
	Aerospace Ctg. - Point	none (assumed to be covered by MACT)		0	0			
	Aerospace Ctg. - Area	MACT/SCAQMD limits	0.5	0.3	4,000-5,000			
3	Autobody Refinishing	VOC Content Limits; CA Best Available Retrofit Control Technology				0	N/A	
	Auto Ref. - Area	SCAQMD Limits	10.8	3.8	3,700			
4	Surface Cleaning/Degreasing	CARB's Best Available Control Technology; Low-VOC Solvents				0	N/A	
	Surface Cleaning/Degreasing	SCAQMD Limits	14.8	5.9	Cost Saving $100			
5	Gasoline Service Stations: Underground Storage Tanks	Install Pressure Vacuum (PV) Valves on Vent Line	0.2	0	20-615	0	N/A	

7	Petroleum Refinery Fugitive Emission Leaks	Inspection and Maintenance Program				0		
	Refinery Fugitives	More Stringent LDAR	5.3	1.0	680-1,150	0		
8	Rule Effectiveness Improvements	Increase Compliance with Regulations						
	Rule Effectiveness Improvements	Increased Compliance Activities		21.7	Unknown		0	
9	Web Offset Lithography	Carbon Adsorber				0		
	Web Offset Lithography	Beyond CTG Req. (e.g., carbon adsorp.)	0.7	~0	Unknown			
10	Graphic Arts	Low-VOC Inks and Cleaning Solvents				0		
	Graphic Arts	Extend RACT to Small Sources	2.4	1.5	3,500-4,800		N/A	
12	Pesticides	Reformulation to Lower VOC Content				0		
	Pesticides	CA FIP Rule	1.4	0.3	1,000			
13	Utility Boilers							
	Coal-Fired Boiler	LNB + Overfire Air Plus (Phase 2 NO_x MOU)	0.3			10.8		
	Coal-Fired Boiler	Selective Catalytic Reduction (SCR)	0.3			10.8	4.0	4,000
	Oil/Gas-Fired Boiler	LNB	0.8			23.2		
		SCR					9.0	4,400
14	Industrial Boilers		1.0			29.0		
	Coal-Fired	LNB	0.1			3.3	1.8	2,400
	Gas/Oil-Fired	LNB + Flue Gas Recirculation (FGR)				25.3	16.5	2,000-4,000
18	Glass Manufacturing	LNB	0			1.6		
		SCR					1.2	800-2,950
		Oxy-Firing					1.2	2,150-5,300
19	Gas Turbines: Natural Gas	LNB SCR + Steam Injection	0	0		0	0	3,580-10,800
20	Gas Turbines: Oil	Water Injection NSCR + Water Injection	0.6	0		6.6	4.0	2,690-8,100
21	Reciprocating IC Engines: Diesel/Oil	Ignition Timing Retard	0	0		0.1		
		SCR					0.1	580-4,810
22	Reciprocating IC Engines: Natural Gas	Air/Fuel (AF) Ratio Adjustment + ITR	0.5	0		11.3		
		SCR					10.1	580-4,810
		NSCR					10.1	180-310
23	Process Heaters: Natural Gas or Oil	LNB + FGR	0.1	0		10.4	6.8	1,500-2,300

24	Iron and Steel Mills	LNB + FGR or LNB + SCR	0.4	0		1.0	0.8	800-2,960
		LNB + SCR					0.8	2,150-5,300
25	Industrial, Commercial, and Institutional Combustion	RACT to Small Sources	1.0	0		25.2	12.6	
		RACT (LNB) to Smaller Sources: Coal Oil/Gas				0.6 24.6	0.3 12.3	1,600 760-1,400
26	Residential Water Heaters	LNB	0	0		0.9	0.1	Unknown
27	Residential Space Heaters	LNB		0		0	0	0
28	Medical Waste Incinerators	SNCR	0	0		0	0	12,000
29	Municipal Waste Incinerators	SNCR	0	0		0.1	<0.1	1,000-4,000
31	Highway Vehicles and Stationary Sources	Ozone destroying paint - air handling systems, car radiators		0			0	
32	Asphalt Paving	Driveways - Non-HC Asphalt	1.6	0		0	0	N/A
33	Consumer Solvents	Driveways - Sealer Low VOC	0.16	0.01	237	0	0	N/A
34	Transportation	Land Use Planning - Promote Community Centers	66.6	1.06	17,500-19,100	105.8	0.96	--
35	Light-, Medium-, and Heavy-Duty Diesel Vehicles and Trucks	California Reformulated Diesel Program	2.8	0	N/A	11.3	0.8	$3,700-7,700
36	Light-Duty Gasoline Vehicles and Trucks	More Remote Sensing	63.8	1.2	3,340	94.5	0.6	--
37	Light-Duty Gasoline Vehicles and Trucks	Scrappage Programs	63.8	0.1	4,800	94.5	0.1	--
38	Heavy-Duty Diesel Trucks	Vehicle Emission Inspections	2.8	<0.1		11.3	0	
39	Light-, Medium-, and Heavy-Duty Diesel Vehicles and Trucks	Emission-Based Registration Fees	66.6	2.8	18,750	105.8	8.7	--
41	All Vehicles	Eliminate Excessive Curb Idling		0	0		0	0
42	Urban Buses	Emissions Reduction Credit for Heavy-Duty Buses						
42a	Highway Vehicles	Emissions Reduction Credit for Heavy-Duty Buses: Clean Diesel for SEPTA-baseline	2.8	.47	0	11.3	2.19	0
42b	Highway Vehicles	Alternative Fuel Vehicles SEPTA: CNG for Frontier Division Business	2.8	.01	457,800	11.3	0.23	26,700
43	All Vehicles	Smoking Vehicle Program	66.6	0.2	6,300	105.8	0	--
44	Highway Vehicles	Traffic Flow Improvements - Advanced Signal on 50 miles of Congested Arteries	66.6	0.15	21,620	105.8	0.16	
45	Highway Vehicles	Traffic Flow Improvements - CBD Signalization		0.35	125,048		0.27	
46	Highway Vehicles	Traffic Flow Improvements - Congestion/		0.16	200,452		0.07	

		Incident Management on Freeways						
47	Highway Vehicles	Traffic Flow Improvements - Ramp Metering		0.41	2,700		0.034	
48	Highway Vehicles	Traffic Flow Improvements - Enforce 55 mph on PA Turnpike		0.18	11,166		0.63	
51	Highway Vehicles	Transit Operations - Rail Headway Improvements - Planned R 7 Changes	66.6	0.04	369,600	105.8	0.06	246,400
55	Highway Vehicles	Transit Operations - Improve Suburban Bus Service		0.07	45,356		0.10	
56	Highway Vehicles	Transit Operations - Transit First Principles		0.02	123,079		0.02	
57	Highway Vehicles	Transit Operations - Reuse of Surplus Light Rail and Trackless Trolleys		0.01	92,277		0.01	
58	Highway Vehicles	Transit Operations - Improve City Transit Division Service		0.09	42,637		0.09	
59	Highway Vehicles	Transit Operations - Philadelphia to Harrisburg Rail Service Improvements		0.01	619,774		0.03	
61	Highway Vehicles	Transportation Management Plans - Comprehensive Regional Ridesharing Program		0.30	10,262		0.33	
62	Highway Vehicles	Transportation Management Plans - Availability and Promotion of Average $25 Transitchek		0.12	128,691		0.14	
63	Highway Vehicles	Transportation Management Plans - Telecommuting		0.59	14,272		0.68	
64	Highway Vehicles	Transportation Management Plans - Compressed Work Weeks		0.21	11,226		0.27	
69	Highway Vehicles	Parking Management - Construct New Park and Ride Lots Along Highways		0.05	139,991		0.08	
70	Highway Vehicles	Parking Management - Expand Parking at Rail Stations (combine with #69) Planned Expansion	66.6	0.03	274,150	105.8	0.04	169,950
71	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - Auto Work Trips		0.21	48,740		0.18	
72	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - 14 Rail Station Trips		0.00	65,513		0.00	
73	Highway Vehicles	Non-Motorized Programs and Facilities - Comprehensive Bicycle Improvements - Non-work Trips		0.33	21,709		0.34	
74	Highway Vehicles	Emissions Reduction Programs - Removal of 50% of Pre-1980 Vehicles	66.6	0.4	57,354	105.8	0.3	

75	Highway Vehicles	Emissions Reduction Programs - Reduction in Cold Starts/Insulate Catalytic Converters		1.00	1,864		0.63		
76	Highway Vehicles	Emissions Reduction Programs - National LEV Program	66.6	11.5	1,860	105.8	13.5		
77	Highway Vehicles	Pricing Mechanisms - Feebate on New Car Purchase		0.28	4,393		0.17		
78	Highway Vehicles	Pricing Mechanisms - Gas Tax (84¢ per gallon)		5.20	(205,484)		8.70		
79	Highway Vehicles	Pricing Mechanisms - VMT Tax (4¢ per gallon)	66.6	5.20	(205,412)	105.8	8.70		
84	Highway Vehicles	Transit Operations - Grants to Non-profits to Promote Transit		0.016	52,700		0.023	35,800	
91	Highway Vehicles	High Occupancy Vehicle Lanes	66.6	0.6	Very High	105.8	1.3	Very High	
96	Highway Vehicles	LPG - Pilot Programs at Service Stations		2.41	11,200		1.42		
	Highway Vehicles	CNG - Pilot Programs at Service Stations	66.6	2.41	174,100	105.8	1.42	294,300	
100	Highway Vehicles	Area Source Business - Credits for Alternative Fuel Vehicles			3,700-9,200			--	
103	Marine Vessels	Control of Emissions (NO_x) from Ships and Ports	0	0	N/A	0	0	$10,000	
104	Commercial Marine Vessels	Emission fees ($10,000 per ton NO_x)	0	0%	N/A	0	0	$10,000	
105	Lawn and Garden	Emission Reduction Credits for Leaf Blowers; Electric Lawnmowers	30.1	3.0	1,200	1.3	0.1	62,000	
106	Lawn and Garden	Incentives for Electric Lawnmowers	30.1	3.0	1,200	1.3	0.1	62,000	
107	Nonroad	Nonroad Engine Emission Reduction Credit Programs	16.0	1.6	3,700-9,200	63.0	6.3	--	
109	Aircraft	Control of Emissions from Aircraft and Ground Support Equipment	9.4	1.6	~0	10.7	0.23	$970	
	Aircraft	CNG-fueled Shuttle Buses		0.01	730,200		0.05	--	
	Aircraft	LPG-fueled Shuttle Buses		0.005	(207,500)		0.003	--	
11	≥175 horsepower Compression Ignition (Diesel) Engines:	California Phase II Exhaust Standards and EPA Statement of Principles with Engine Manufacturers							
	Construction Equipment: Scrapers, Bore/Drill Rigs, Excavators, Cranes, Off-Highway Trucks, Rubber Tired Dozers, and Off-Highway Tractors Logging Equipment: Fellers/Bunchers		7.1	0	Unknown	43.3	0.8	Unknown	
2	Recreational Vehicles								
	2-stroke engine category	Potential CARB Standards	0.6	0.3	60-700	9.3	0	N/A	
	4-stroke engine category	Potential CARB Standards		0	60-700		0	N/A	

113	Open Burning	Ban on High Ozone Days	0.23	0.18	~0	0.1	0.08	
114	Open Burning	Year Round Ban	0.23	0.18	~0	0.1	0.08	
116	All Lawn Care	Ban on High Ozone Days	30.1	11.2	0	1.3	6.7	
118	Motor Vehicles	Voluntary "No-Drive" Measure	63.1	5.1		92.6	7.4	
119	All Sources (or a Subset)	Cap and Trade			1,000-1,800			
120	All Sources (or a Subset)	Open Market Trade			1,000-1,800			
122	Various	School-Based Public Awareness Ozone Action		4.6	101,700		7.8	--
123	Various	Promote We Care Programs to Businesses		Included in 122				
124	Various	Outreach and Education - Environmentally Responsible Behavior - Green Light		Included in 122				
126	Various	Buying Emission Reduction Credits So They Cannot be Used (NO_x and VOC)			Market Price			Market Price
127	Various	Reduce ERCs by X% per Year While They Are in the Bank (NO_x and VOC)			Market Price			Market Price
129	Highway Vehicles	Ozone Action Days Transit Strategy	66.6	1.4	25,600	105.8	2.5	
130	Non-road Spark Ignition Engines <25 hp	No Non-road SI Engines Standard Because of NO_x Disbenefit		(21.0)			13.0	
131	Lawn & Garden Refueling	Leakless Gas Can Nozzles	2.5	2.2	1,400-5,800	0	0	N/A
Outside Five County Area Measures								
85	Highway Vehicles	Stage II - Entire Region (Beyond 5 County)	5.0	3.3	900	0	0	
128	Highway Vehicles and Non-road	Expand Reform Gas Area to Counties North and West of Five County Area	56.0	14.8	5,800-10,300	67.0	4.0	--

Demoted Measures									
6	Bulk Terminals	Vapor Recovery System							
11	Adhesives: Industrial	Reformulation and Product Substitution							
15	Adipic Acid Manufacturing Plants	Thermal Reduction							
16	Nitric Acid Manufacturing Plants	Extended Absorption	0			0			
		SCR	0			0			
		Nonselective Catalytic Reduction (NSCR)				0			
17	Cement Manufacturing	LNB SCR SNCR (Urea-based)	0						
30	Various	Small Business Tax Incentives				0			
40	Light-Duty Vehicles and Light-Duty Trucks	Eliminate Excessive Car Dealership Vehicle Starts							
49	Highway Vehicles	Transit Operations - Restore Regional Rail Service		0.01	857,915		0.02		
50	Highway Vehicles	Transit Operations - Extension of Route 66 Trackless Trolley		0.00	952,400		0.00		
52	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 10%	66.6	0.09	109,255	105.8	0.13		
53	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 20%		0.20	99,102		0.26		
54	Highway Vehicles	Transit Operations - Systemwide Fare Reductions of 50%		0.47	112,247		0.69		
60	Highway Vehicles	Transportation Management Plans - ETRP		1.80	(36,649)		2.20		
65	Highway Vehicles	Parking Management - Prohibit New Parking Facilities in CBD		Negligible Impact	Negligible Impact		Negligible Impact		
66	Highway Vehicles	Parking Management - Limit Parking Facilities at New Suburban Employment Sites		0.08	(33,728)		0.08		
67	Highway Vehicles	Parking Management - $3 Parking Surcharge		1.90	(435,912)		2.50		
68	Highway Vehicles	Parking Management - $3 Parking Tax in the CBD		0.47	(43,909)		0.73		
80	Highway Vehicles	Pricing Mechanisms - Double Tolls on PA Turnpike During Peak Periods		0.01	0		0.00		
81	Highway Vehicles	Emission Reduction Programs - Alternative Fuels - SEPTA	2.8	0.14 (0.61 with 42a)	229,500 (53,300 with 42a)	11.3	2.4 (4.6 with 42c)	13,550 (7,100 with 42a)	
82	Highway Vehicles	Transit Operations - Reduce SEPTA Fares July-August							

83	Highway Vehicles	Pricing Mechanisms - HOV Parking Rate Incentive						
86	Highway Vehicles	Stage II - Statewide		60-70%			0	
87	Highway Vehicles	Ride Sharing						
88	Highway Vehicles	Increase Mass Transit Ridership - Parking Taxes, Market Incentives						
89	Highway Vehicles	Flat Tax on Vehicles - $200?						
90	Highway Vehicles	Build Two-Tier Highways						
92	Highway Vehicles	Traffic Flow @ 45 mph						
93	Highway Vehicles	Insulate Catalytic Converters						
94	Highway Vehicles	Promote Telecommuting						
95	Highway Vehicles	Credits for Compressed Work Week						
97	Highway Vehicles	Non-Employee Trip Reduction - Health Clubs						
98	Highway Vehicles	Buy New Engines for SEPTA - CNG, LPG						
	Highway Vehicles	Buy New Engines for SEPTA - LNG - Fleet Replacement Program	2.8	.14 (.61 with 42a)	337,000 (78,300 with 42a)	11.3	2.4 (4.60 with 42a)	19,900 (10,400 with 42a)
99	Highway Vehicles	Clean Fleet Replacement for Institutions, Large Businesses						
	Highway Vehicles	Clean Fleet Replacement for Institutions, Large Business - Light-Duty Vehicles	66.6	2.89	12,400	105.8	1.71	20,900
101	Highway Vehicles	Voluntary ETR						
102	Highway Vehicles	Alternative Fuel Vehicle - Build Fuel Stations						
108	Locomotives	Regional Railroad NO_x Emissions Reduction Measure	0.8	0%		8.2	2.9-3.5%	
110	Locomotive Engines	Potential Federal NO_x Emission Standards Potential CA NO_x Emission Standards	0.8			8.2	3.3% 6.6%	
115	Commercial Lawn Care	Ban on High Ozone Days						
117	Recreational Boating	Ban on High Ozone Days	10.9			1.1		
121	All Sources (or a Subset)	Across the Board Emission Reductions						
125	Various	Environmental Think Tank						

APPENDIX D

Operating Agreements

OPERATING AGREEMENTS FOR STAKEHOLDER DELIBERATIONS
Finalized - May 6, 1996

PURPOSE

To recommend strategies for ozone attainment and maintenance based on the current health-based standards and the requirements of the Clean Air Acts.

ROLES

Stakeholder Representative Roles

Each member of the Ozone Stakeholder Working Group is expected to: (a) regularly attend and prepare for work sessions of the Ozone Stakeholder Working Group; (b) clearly articulate and represent the interests of his/her group, when appropriate; (c) listen to other points of view and try to understand the interests of others; (d) openly discuss issues with people who hold diverse views and participate in a cooperative problem solving procedure to resolve differences; (e) generate and evaluate options to address the needs expressed by the Ozone Stakeholder Working Group; (f) keep his/her constituent group(s) informed and solicit their input, when appropriate.

Facilitators

CDR Associates will provide facilitation services to the Ozone Stakeholder Working Group. The facilitators will design and implement discussion and decision making procedures to help the Working Group accomplish its goals. In consultation with the Process Advisory Committee, the facilitators will design work session agendas. They will conduct the meetings, provide a procedural structure, and make strategic suggestions as to how cooperative problem solving can be implemented. They will remain impartial toward the substance of the issues under discussion. Any decision that results from the facilitators' activities will be a group decision, not a decision of the facilitators. The facilitators will remain responsible to the whole group and not to one member or interest. The facilitators will enforce ground rules that are accepted by the group and that support the effective working relationship of the group.

Process Advisory Committee

The Process Advisory Committee (a subset of the stakeholders) will work with the facilitators to help with the process (develop agendas, frame issues, develop the problem solving process, etc.). Stakeholders may raise any procedural concerns with a member of the Process Advisory Committee or directly with the facilitators to improve the problem solving process.

Technical Consultants

The Ozone Stakeholder Working Group will solicit technical assistance as needed to inform the deliberations. Services might include data collection, modeling and analysis. The Commonwealth will provide the technical consultant to support the Ozone Stakeholder Working Group. In order to support the Ozone Stakeholder Working Group in a expeditious manner, the technical consultant will be selected from an existing PA Department of Transportation contract. Penn DOT will manage the administrative aspects of the contract; the substantive focus will be managed by the stakeholder group and its Data Advisory Committee. Individual stakeholders may bring additional information, collected through their own sources, into the stakeholder deliberations. The stakeholders may accept the information directly or refer it to the Data Advisory Committee.

Data Advisory Committee

The Data Advisory Committee (a subset of the stakeholders) will work with the facilitators and the stakeholders to help with technical questions, data collection, technical presentations, consultant selection and budget allocation.

DECISION MAKING

Consensus

The negotiators will use a consensus decision making process.

Consensus is an agreement built by identifying and exploring all parties' interests and by assembling a package agreement which satisfies these interests to the greatest extent possible. A consensus is reached when all parties agree that their major interests have been taken into consideration and addressed in a satisfactory manner so that they can support the decision of the group. The process of building consensus involves the development of alternatives and the assessment of the impacts of those alternatives. A consensus agreement is one that all parties can live with.

Consensus does not necessarily mean unanimity. Some parties may strongly endorse a particular solution while others may accept it as a workable agreement. Group members can participate in the consensus without embracing each element of the agreement with the same fervor as other members, or necessarily having each of his or her interests satisfied to the fullest extent. In a consensus agreement, the parties recognize that, given the combination of gains and trade-offs in the decision package and given the current circumstances and alternative options, the resulting agreement is the best one the involved parties can make at this time.

Key Principles of Consensus

- To achieve consensus, everyone in the group must actively participate.
- To participate fully and freely, all group members must have a common base of information and keep up-to-date on the progress of the group.
- A norm must be created in which everyone will feel comfortable to state his or her views and to disagree.
- A disagreement can illuminate unrecognized problems and serve as a catalyst for improving the decision.
- The goal of the group is to discover the unmet need that has produced an objection and to find a way to meet that need in a revised agreement, rather than to suppress the objection.
- Agreement on definition, principles and criteria should precede and become the underpinnings of substantive agreements.

If there are issues the stakeholders cannot resolve through consensus decision making, the stakeholders will summarize the issue and fully document the remaining differences, including the specific concerns of individual stakeholders. Implementing agencies will use this summary as they advance ozone attainment in line with their mandates and air quality responsibilities.

CONSTITUENTS

Informed constituencies will enhance the prospects for approval of the recommendations of the Working Group. The members of the Ozone Stakeholder Working Group who represent agencies or constituencies will inform their constituents on an ongoing basis as to the issues under discussion and the progress being made in the cooperative problem solving sessions. They will represent the interests of their constituent group and bring their constituents' concerns and ideas to the negotiation. Members of the Working Group may elect to hold regular meetings with their constituent group (a formal caucus), to provide copies of work session summaries to their constituents and request comments, and/or to communicate informally with their constituents as appropriate.

REPRESENTATION

To enhance creativity during meetings, individuals who represent agencies or constituencies are not expected to restrict themselves to the prior positions held by their agencies or constituencies. The goal of the stakeholder group is to have frank and open discussion of the issues in questions and the options to address the issues.

Therefore, ideas raised in the process of the dialogue, prior to agreement by the whole group, are for discussion purposes only and should not be construed to reflect the position of a stakeholder or to prematurely commit the group or any one stakeholder. Stakeholders are expected to serve as a continuous liaison so that the interests of any agency or constituency they represent are represented while the stakeholders give thorough consideration to new options.

ATTENDANCE

Participating in consensus decision making requires consistent attendance. Should a stakeholder be unable to attend, and should the stakeholder choose to nominate an alternate, an alternate may attend the meeting. Alternates must attend as many meetings as possible. Alternates may enter into the deliberations and into decision making when the stakeholder is not present. Alternates will not be allowed to keep the group from moving forward or delay a decision because they do not have knowledge or authority to decide. Stakeholder representatives and alternates are responsible for staying current with any sessions they are unable to attend. Stakeholders are not obligated to use the time dedicated to problem solving sessions to backtrack and accommodate those who have not attended a prior meeting.

SUPPORT

Stakeholders are encouraged to bring staff from their agency/organization and members of their constituency to support the problem solving process. Stakeholders can defer to those individuals when their expertise is required or when requested by the Working Group. The use of support staff must not disrupt stakeholder deliberations. Only stakeholder representatives and alternates (when the representative is absent) will enter into consensus decisions.

OBSERVERS

Ozone Stakeholder Working Group Meetings will be open to the public. Input by non-members may be useful to the Ozone Stakeholder Working Group. However, in order for the Working Group to achieve its mission, discussion and deliberation at Committee work sessions must be focused and manageable. Participation of non-members of the Working Group will be at the discretion of the Working Group. Opportunities for participation by non-members include:

1. Opportunity for non-members to discuss their views with members of the Working Group during breaks.

2. Scheduled time at the end of the work sessions for questions and comments from non-members (10 or 15 minutes).

COMMUNICATING WITH THE PUBLIC

The Ozone Stakeholder Working Group may elect to hold public meetings to provide information to the public on the Working Group's progress and/or to solicit input from the public.

Work session summaries will be available to the public upon request. The DEP Newsletter, UPDATE, will list meeting notices and agendas. Information, including meeting summaries, will also be posted on DEP's World Wide Web Public Participation Center.

DISCUSSION GUIDELINES

The following guidelines encourage productive negotiations. Members of the Ozone Stakeholder Working Group will commit to "best efforts" at following them and will give the facilitators the authority to enforce them:

- It is absolutely crucial that everyone have a chance to be heard and to hear others. Therefore, side conversations or interruptions while someone is speaking should be avoided.

- In order to give everyone a chance to talk, participants should be sensitive about the length and pertinence of their comments and the importance of encouraging participation from all members of the group.

- In order to maximize the productive time available, people should avoid repeating points that have already been adequately made by others, except to briefly indicate concurrence.

- It is important to remain open-minded about proposals, ideas, concerns, etc., while different points of view are being presented and discussed. Rather than label particular proposals as "good" or "bad," it will be useful to be open to the underlying concerns that are expressed in a proposal.

- Disagreement is inevitable, but **must** be focused on the issues involved rather than based on perceptions of motives or relationships and personalities.

- The consensus process is a cooperative, joint problem-solving effort. Therefore, members **must** avoid competitive behavior that denigrates other participants or that is disruptive to the work of the group.

- The work sessions will begin and end promptly at the scheduled times.

COMMUNICATING WITH THE MEDIA

Work sessions of the Ozone Stakeholder Working Group will be open to the public, including the media. The consensus process is a solution-oriented, problem solving approach, not a platform for lobbying the public through the media. The deliberations of the Ozone Stakeholder Working Group should not be used as opportunities for individual members to posture in order to gain the attention of the media.

If the Working Group as a whole decides that there is a need for the Group to communicate with the press, the Working Group members will designate a spokesperson(s) and/or draft a statement. Stakeholders can refer members of the press to CDR for questions about the process and to DEP for information about the stakeholder group's progress on substantive issues.

In communicating with the media and the general public, a clear distinction should be made between preliminary information, concept papers, or proposals under consideration and final decisions. It is important to differentiate between discussions and decisions. Preliminary documents will be marked with "DRAFT" or "FOR DISCUSSION PURPOSES ONLY."

Each stakeholder is free to speak with the press on behalf of the agency or constituency he or she represents and must make it clear to the press that the comments should not be attributed to the whole stakeholder group. No stakeholder will speak for the whole stakeholder group without express authorization by consensus of the stakeholder group. No stakeholder will characterize the point of view of other representatives.

EXTERNAL INITIATIVES

Stakeholders will disclose to the stakeholder group as a whole any potential initiatives or activities (e.g. law suits, legislative actions) that could impact the functioning of the stakeholder group or be of interest to the stakeholders. Stakeholders will provide the information in an open and timely manner. DEP, EPA, the City of Philadelphia and any other stakeholder will keep the group informed of any policy, regulation or legislation related to the ozone problem.

TASKS GROUPS

The Ozone Stakeholder Working Group may form task groups to perform specific functions or develop proposals on specific issues. Information and recommendations the task groups develop will be presented to the stakeholders for the Committee's consideration. The composition and scope of work for each task group will be designated by the stakeholders. The task groups may include technical support from non-members of the working group.

INSPECTION AND MAINTENANCE WORKING GROUP

While the ozone stakeholder group deliberates, a separate but related group will be working to outline the details of a successful, decentralized emissions program. The ozone stakeholder group is responsible for policy level recommendations about the emissions program's contribution to ozone attainment. The I and M Working Group will take policy direction from the ozone stakeholders and then is responsible for recommendations about the emission program's implementation.

APPENDIX E

Glossary

AQMD	air quality management district
BTU	British thermal unit
CAAA	Clean Airs Act Amendments of 1990
CFFV	clean fuel fleet vehicle
CMSA	consolidated metropolitan statistical area
CNG	compressed natural gas
DEP	Pennsylvania Department of Environmental Protection
DERs	discrete emissions reductions
DVRPC	Delaware Valley Regional Planning Commission
EPA	U.S. Environmental Protection Agency
ERC	emission reduction credit
FIP	Federal Implementation Plan
g/bhp-hr	grams per brake horsepower hour
I/M	inspection and maintenance
IC	internal combustion
LEV	low-emission vehicle
LNB	low NOx burner
LPG	liquefied petroleum gas
MACT	maximum achievable control technology
mmbtu	million BTU
MOU	memorandum of understanding
MPO	metropolitan planning organization
MTBE	methyl tertiary butyl ether
NAAQS	National Ambient Air Quality Standard(s)
NGV	natural gas vehicle
NLEV	national emission vehicle
NOx	nitrogen oxide
OBD I	phase I onboard diagnostics
OBD II	phase II onboard diagnostics
OBD	onboard diagnostic
OTAG	Ozone Transportation Assessment Group
OTC	Ozone Transport Commission
PennDOT	Pennsylvania Department of Transportation
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
PV	pressure vacuum
RACT	reasonable available control technology
RFG	reformulated gasoline
RVP	reid vapor pressure
SCR	selective catalytic reduction
SEPTA	Southeastern Pennsylvania Transportation Authority
SIP	state implementation plan
SCAQMD	South Coast Air Quality Management District
SNCR	selective non-catalytic reduction

TCMs	transportation control measures
tpd	tons per day
tpsd	tons per summer day
tpy	tons per year
VOC	volatile organic compounds

OZONE STAKEHOLDERS

Richard Bickel, Southeastern Pennsylvania Transportation Authority - SEPTA
Dennis Capella, PECO Energy Company
Francine Carlini, Pennsylvania Department of Environmental Protection - Philadelphia Region
Tom D'Alessandro, Thomas Jefferson University Hospital
Ned Griffith, ARCO Chemical Company
Mark Hammond, Graphics Arts Association
Paul Hess, DEP Citizens Advisory Council
Anthony Ippolito, Sun Company/Associated Petroleum Industries of Pennsylvania
David Jackson, Chester County Health Department
Rosalind Johnson, Sea Change
David Lee, ASE SAE
Shirley Loveless, Pennsylvania Environmental Council
Tom Maslany, U. S. Environmental Protection Agency
Audrey Miner, Pennsylvania Department of Transportation
Joseph Otis Minott, Clean Air Council
Patrick O'Neill, City of Philadelphia
Nancy Parks, Sierra Club
Jim Peruto, Keenan Motors
Peter Quinn, Greater Valley Forge Transportation Management Association
Ron Roggenburk, Delaware Valley Regional Planning Commission
Jim Rue, Pennsylvania Department of Environmental Protection
Jerry Schantz, Automotive Service Association of Pennsylvania
Michael Stokes, Montgomery County Planning Commission
Suzanne Verzilli, Rohm and Haas
Andy Warren, Pennsylvania Department of Transportation
Jack Weber, AAA Mid-Atlantic
Jill Sebest Welch, Delaware County Transportation Management Association

FACILITATOR

Mike Hughes – CDR Associates

MEMORANDUM OF THE STATES OF THE OZONE TRANSPORT COMMISSION CONCERNING A REGIONAL STRATEGY FOR THE DEVELOPMENT OF NEW CONTROL MEASURES

WHEREAS there is a pervasive ground-level ozone problem in the Northeast and Mid-Atlantic States; and

WHEREAS the Ozone Transport Commission was created by Congress to coordinate ground-level ozone control planning for the region; and

WHEREAS the Northeast and Mid-Atlantic States have adopted and implemented control measures both required by the Clean Air Act and beyond those required by the Clean Air Act to attain and maintain the one-hour National Ambient Air Quality Standard (NAAQS); and

WHEREAS the U.S. Environmental Protection Agency has formally called for revisions of State Implementation Plans (SIPs) for nitrogen oxides over a 22-State area to address regional ozone transport over the eastern United States; and

WHEREAS this call for SIP revisions is currently under litigation; and

WHEREAS the U.S. Environmental Protection Agency has finalized a rule under Section 126 which will require major stationary sources to reduce emissions of nitrogen oxides (NOx) covering a large part of the reductions required by the SIP call, including those closest to the Ozone Transport Region (OTR); and

WHEREAS States in the OTC have committed to achieve additional reductions of NOx and VOC emissions to help ensure attainment and maintenance of the ozone standard in the OTR; and

WHEREAS OTC has already started the development of new regional NOx and VOC control measures;

THEREFORE the undersigned States hereby agree to cooperate in the development of additional regional control measures in the OTR; and

FURTHERMORE that as part of this process that OTC will hold public meetings on possible control measures in order to get input from interested parties; and

FURTHERMORE that initial control measure recommendations will be developed for OTC action no later than the 2000 OTC Annual Meeting, and that final control measure recommendations will be developed no later than the 2001 OTC Winter Meeting, in order to facilitate action by OTC States by required dates; and

FURTHERMORE that the final recommendations to OTC for action should consider both regional measures intended to be implemented across the OTR for attainment and maintenance of the one-hour ozone NAAQS, as well as other measures that individual States could implement to meet applicable requirements.

DRAFT

List of draft option summaries included in this package

Emission Reduction Measure #1

Regional Cleaner Diesel Fuels

Cleaner diesel fuel can be achieved by modifying a number of characteristics of diesel fuel. Two options to be considered are reducing the sulfur content and increasing the cetane (index) for diesel fuel. These two components are discussed separately in this document, but in a strategy or measure could be considered together.

Low Sulfur Diesel Fuels

The sulfur content of diesel fuel for both onroad and nonroad heavy-duty vehicles would be regulated to realize the benefit of EPA new engine and chassis standards that will take effect no earlier than 2005.

Control Option

A national fuel program would best address the interstate nature of onroad vehicles. The needs of the OTR necessitate an early introduction of a regional program including the following measures:

- A sulfur cap of 500 ppm (currently an average of 3,000 ppm) for nonroad fuel (including that used in locomotives and marine engines) to be implemented as soon as practicable.
- A low sulfur cap for both onroad and nonroad heavy-duty diesel vehicles between 30 and 50 ppm to be phased in from 2005 to 2007.

Emissions Reduction

- EPA has stated in its proposed engine rule that no diesel fuel changes are necessary for implementation of 2004 engine standards. EPA has not determined the emission reductions achievable using the technology required under these new standards.
- Emission reductions of 75 percent for NOx and 70 percent for PM have been predicted for heavy-duty diesel vehicles meeting the post-2004 standards.

Implementation

- Many refiners will need to invest substantially for improvements in their refineries in order to reduce fuel sulfur levels, though some refineries are currently capable of producing fuels with low sulfur levels.
- A national program would be particularly beneficial for a heavy-duty onroad diesel program due to the interstate nature of trucks.
- Coordinated fuel strategies would have the best chance of adoption and provide refiners with certainty to protect consumers from price instability. Moving forward with both on and off road fuel requirements should help with equity issues perceived by motorists and the trucking industry.
- Implementation of fuel regulations is conducted mostly at the terminal level. The use of diesel fuel for both on and off-road purposes as well as for non-transportation uses might complicate enforcement.

Cetane Content in Diesel Fuel

Cetane is one of several indicators of the performance of diesel fuel. It is a relative measure of the interval between the point of injection and ignition of the fuel. The higher the cetane, the shorter the delay interval and the better the performance level. Generally, diesel engines will operate better on fuels with cetane numbers above 50.

Control Option

Requiring an increase in cetane content in diesel fuel in the Ozone Transport Region (OTR) from the current level of 43 to the suggested level of 50 would provide for the following:

- A cetane content requirement for all diesel fuel marketed to onroad and nonroad vehicles in the OTR.
- A higher cetane of 50, which was used until the late 1970's, is actually better for engine performance.
- Increased cetane levels reduce white smoke, reduce engine noise and vibration, and make starting easier.
- Cetane may be increased through reformulation and use of product additives.

Emissions Reduction

Raising the cetane content in diesel would result in the following emissions reductions:

- A 5% decrease in NOx heavy-duty emissions and a 50% decrease in VOC emissions.
- NOx emissions reduced an additional 25 to 40 tons per day.

Implementation

- The cost of raising cetane number from 43 to 50 is calculated to be 1.1 cent per gallon with a reduction cost of $1,044 per ton NOx and VOC reduced.
- Cetane levels requiring reformulation (above 50) are more expensive and would be less timely.
- Cetane additives can be added at the terminal prior to delivery and their use can start almost immediately since no construction is required.
- The OTR creates a large enough market for higher Cetane fuel so as not to cause distribution difficulties.
- A decrease in NOx due to cetane may be followed by an increase in particulate emissions.

Emission Reduction Measure #2

Regional Cleaner Gasoline

This control option would require the development of characteristics that need to be in gasoline to satisfy regional needs. Two characteristics of a regional fuel are covered in this document. The OTC has expressed the need for a low sulfur fuel. In addition, a number of States have expressed interest in a "phase-down" of MTBE in gasoline. Recently EPA finalized its National low sulfur program. While these fuel issues are treated separately in this document, as a regional strategy or option they could be considered together.

Issues related to a Low Sulfur Gasoline Backstop

The sulfur content of gasoline for mobile on-road sources, including light-duty vehicles, trucks, motorcycles, and heavy-duty vehicles would be regulated. While a national program for lowering sulfur gasoline content would provide optimal emission reductions, the OTR needs reductions as soon as possible to meet the one-hour standard. A backstop OTR-wide low sulfur gasoline program is needed in case a national program is not implemented in a timely and effective manner.

Control Option

An OTR-wide, year-round program limiting sulfur content would provide for the following:

- A reduction of sulfur levels from an average of 300 ppm to an average of 30 ppm by weight, with a per gallon cap of 80 ppm.
- The reductions could be phased in as follows:

	January 1, 2004	January 1, 2005
Retail Average, ppm	30	30
Per-gallon Cap, ppm	120	80

Emissions Reduction

- Emission reductions increase as sulfur levels decrease. Although desulfurization technology will increase NOx and VOC emissions from refineries, overall emissions in the OTR would still decrease significantly.
- Low sulfur gasoline is needed for promising new technologies. For example, gasoline direct injection engines and fuel cells can tolerate very little sulfur.
- Estimated reductions are as follows:

2007 Reductions	TPD (percent of total OTR emissions)
NOx	At least 239 tons per day (4 percent)
VOC	At least 58 tons per day (1 percent)

Implementation

- Emissions reductions are approximately less than $2500 per ton of pollution (NOx + VOC) removed.
- The cost of gasoline would increase by approximately two cents per gallon.
- California, Georgia, and North Carolina all have experience implementing programs reducing sulfur content of fuels.
- A national program would provide the most emission benefits. A major concern for a regional program is the reversibility of the negative impact of high sulfur gasoline on vehicle emission systems.

- It is currently technologically feasible to reduce gasoline sulfur content to 30 ppm.

Issues related to MTBE (methyl tertiary-butyl ether)

MTBE is a major constituent of reformulated gasoline. EPA's blue ribbon panel recommends action to reduce the use of MTBE on a national or regional basis because of water contamination problems. MTBE does not present as great of a cancer risk as other gasoline constituents, but it has unfortunate properties that have engendered public concern.

Control Option

Control would be in the form of regulating MTBE as a constituent of gasoline. Nearly three-fourths of gasoline used in the Ozone Transport Region (OTR) in 1997 was reformulated gasoline (RFG) with most using MTBE as an oxygenate. The following provisions would comprise an MTBE reduction:

- MTBE phase-down or complete phase-out.
- Phase-down MTBE in the OTR in four years; no later than the 2005 ozone season.
- Adopt regulatory safeguards to maintain at least current emission benefits for VOC, NOx and toxics in 2005/07 throughout the OTR (both RFG/conventional gasoline areas).
- Adopt ozone season low RVP gasoline (7.0) requirements in the OTR conventional gasoline areas to provide additional upwind reductions (of one-hour nonattainment).

Emissions Reduction

- No net changes from policies in place.
- The levels of VOC, NOx, and toxic emissions for both RFG and conventional gasoline would be no less than in a base year (1999 or 2000) or for RFG Phase II standards; whichever is more stringent.
- There are significant non-ozone benefits, primarily the prevention of further contamination of water supplies.

Implementation

- Several states have current or past experience in implementing state fuels programs (low RVP and oxygenated fuel). California is the only state presently planning an MTBE phase-out in conjunction with other fuel quality changes.
- If ethanol is required to meet an oxygen mandate, RFG total cost-effectiveness could be as much as $16,000/ton; an increase of $7000 over RFG using MTBE (high-end estimates).
- Measure is more cost effective if toxics benefits are included and if oxygen mandate is removed.
- In 1997, OTR consumed about one-fifth of US gasoline, making OTR a large enough region to address distribution concerns. This strategy would continue at least two fuel options in the OTR.
- An expedited implementation of this measure would provide regulatory certainty with implementation of fuel requirements by 2005 ozone season; emission reductions would begin at time of adoption.
- Ethanol as a substitute for MTBE needs to be examined for any adverse emission reduction implications for both ozone and toxics.
- MTBE phase-down or out will be more expensive if the Clean Air Act is not amended to remove the 2% oxygen mandate.
- MTBE reduction with anti-backsliding provisions and improvements in conventional gasoline could be integrated into an OTR-wide fuels strategy.

Emission Reduction Measure #3

Architectural, Industrial, and Maintenance Coatings (AIM)

AIM coatings are paints, enamels, varnishes, lacquers, and specialty type coatings used by industry, contractors, and homeowners to coat stationary structures such as buildings, houses, and pavement/curbs. AIM coatings contain volatile organic compounds (VOCs) which are emitted during application, surface preparation, thinning, drying, and clean up of equipment.

Control Option

The Ozone Transport Commission (OTC) has devised a "glide path" program rather than use regulatory limits:

- Program uses a declining budget with interim targets as a gauge to measure progress.
- Periodic audits allow the AIM industry to demonstrate progress in meeting reduction targets along the glide path.
- Progress can occur from introducing lower volatility products and/or changes in activity.
- The glide path will start from either the EPA federal AIM rule or the Ozone Transport Region (OTR) States' (NY, NJ, MA, RI) AIM rules.

Emissions Reduction

- Architectural coatings in the OTR account for about 357 tons per day of VOC emitted.
- In the last two decades, technology advances in reformulation have brought about lower VOC emitting AIM coatings. However, increases in activity have resulted in only small improvements in reducing VOC emissions.
- AIM rules like New York State's "Part 205" rule adopted in 1988, provided a 9.3% VOC emission reduction (on a constant volume basis) yielding 10 tons reduction per ozone season day in the New York Metropolitan Area (NYMA).

Implementation

- The States of Massachusetts, New Jersey, and New York adopted AIM programs in the late 1980's and early 1990's.
- State programs are deemed to be at least as stringent as the national AIM coating rule adopted by EPA in 1998. These AIM rules set VOC coating content limits and are met by the manufacturers through product reformulation or product substitution.
- Substantial growth in the use of AIM products has and will continue to erode the emission reductions from this category.
- EPA estimates that the national AIM rule produces emissions reductions at a cost of $250 per ton VOC.
- OTC conceptual program includes a regulatory backstop mechanism if the claims of reduced emissions cannot be demonstrated and/or if EPA is reluctant to approve of this approach for SIP credit. The backstop may take the form of a market-based or a command and control program.
- Recordkeeping and reporting requirements may need to be examined to ensure compliance.
- A program to reduce the VOC emissions from AIM coating should take into account specific limits per coating category as well as the emissions associated with increasing activity from AIM coatings use in general.

Emission Reduction Measure #4

Consumer Products

Consumer products are items used by household and institutional consumers including some of the following products: air fresheners, insecticides, hair sprays, antiperspirants, cleaning compounds, automotive specialty products, cosmetics, lawn and garden products, and adhesives. All of these product categories have constituents that may release VOCs through their use, storage, disposal, or decomposition.

Control Option

- VOC emission reductions are obtained by manufacturers through product reformulation and the use of innovative technologies.
- Reductions can be achieved by substituting and promoting use of products with a lower VOC content.
- Adoption of the additional California Air Resources Board (CARB) consumer product categories and VOC limits.

Emissions Reduction

- The national rule (adopted in September 1998, effective in December 1998) regulates 24 consumer product categories accounting for approximately 48% of the inventory and reduces VOC emissions by 20% (90,000 tons VOC per year) from 1990 emission levels.
- This program comes with an estimated annualized cost of $27 million, which resulted in a price increase for consumer products of less than one percent. This cost estimate may even be high due to the fact that many products had already been reformulated to comply with existing state regulations.
- Adoption of the additional CARB consumer product categories and VOC limits would bring about an additional (beyond the impact of the National rule) 20 % VOC emission reduction (approximately 40% total VOC reduction) in the OTR.

Implementation

- Consumer products are currently regulated at the national level by EPA and by a handful of States (CA, MA, NY, NJ, OR, and TX).
- CARB estimates the proposed future year individual VOC limits to cost up to $12,000 per ton of VOCs reduced in California.
- By implementing CARB requirements in the OTR, product reformulation and distribution will likely occur on a national scale.
- To implement the CARB consumer product categories and their VOC content limits a phased-in approach will be utilized. Product categories that have been already reformulated to meet CARB compliance dates can be implemented almost immediately.
- While noticeable reductions are obtainable from the Federal program over half of the inventory is unregulated. Without further requirements, some States will face the scenario of having a decreasing total emission inventory coupled with a growing consumer products emission inventory.

Emission Reduction Measure #5

Mobile Equipment Repair and Refinishing

The mobile equipment repair and refinishing category includes activities related to the repainting and autobody repair of motorized vehicles.

Control Option

EPA has adopted national standards related to the VOC content of the automotive paints and paint additives that may be manufactured, imported, or sold for use in mobile equipment refinishing activities. There are a number of work practice pollution prevention measures that are readily available, reasonable, and cost effective including the following:

- **Improved transfer efficiency paint application equipment:** The use of High Volume Low Pressure (HVLP) spray guns results in reduced paint usage and therefore lower VOC and HAP emissions as well as lower paint purchase costs for the user.
- **Enclosed gun cleaning equipment:** Typical gun cleaning practices can range from the spraying of solvent through the gun into the booth until the gun is clean to the use of commercially available gun cleaners that recycle used solvent.
- **Employee training:** Employee education and training can result in increased efficiency in the use of finishing materials and solvents and reduced VOC and HAP emissions.
- **Solvent and material management practices:** Practices include the following: use of pour spouts for material transfer; covering of paint and solvent containers not in use; and use (mixing and dispense) of minimum amount of paint necessary for each job.

Emissions Reduction

- Generally, the number of mobile equipment repair facilities is directly proportional to population density. Emission reductions will be greatest in the urban areas where VOC emission reductions can have a more significant impact on urban ozone and HAPs.
- The use of HVLP spray guns compared to atomized spray guns can result in 35% greater transfer efficiency and 345 to 400 fewer tons per year VOC emitted.
- Enclosed gun cleaning provides for the recovery and reuse of spent cleaning solvent which minimizes emissions of VOCs and HAPs and reduces solvent replacement costs.
- Improvement in solvent and material management practices minimizes emissions during transfer and storage of materials.

Implementation

- An emission reduction program can best be implemented through a regulatory program including the use of market-based incentives.
- Because the industry is widespread geographically and made up primarily of small business operations, public outreach is an important part of implementation efforts.
- This initiative is based on readily available materials and technology. These measures are cost effective and, in the long run, cost beneficial for affected facilities.

Emission Reduction Measure #6

Solvent Cleaning Operations

Solvent cleaning operations are conducted in virtually all manufacturing, maintenance, business, and commercial facilities as well as in offices and by private citizens. Solvent cleaning activities typically involve the use of solvent liquid or vapor to remove contaminants such as grease, wax, tar, or oil from metal, plastic, glass, and other surfaces. Solvent cleaning is generally performed prior to painting, inspection, repair, heat treating, or machining.

- Vapor cleaning machines use solvent heated above the solvent boiling point.
- Cold cleaning machines use solvents in liquid form.
- Solvent cleaning activities are typically conducted in either batch or continuous cleaning machines or by hand wiping with solvent bearing cloths.

Control Option

- Traditionally, the control of emissions from solvent cleaning has focused on hardware requirements for larger units, i.e., those with a solvent/air interface greater than 10 square feet. This threshold excludes many vapor units and greater than 50 percent of cold cleaners.
- EPA estimates that the halogenated solvent maximum available control technology (MACT) measure will reduce hazardous air pollutant (HAP) emissions from affected units by approximately 66 percent.
- Generally, cold cleaners use non-HAP solvents and many units would not be affected by the MACT. A strategy that requires the use of reduced volatility cold cleaner solvents will produce significant emission reductions.
- A regulatory strategy that incorporates hardware and operating practice provisions consistent with the MACT for non-HAP VOC cleaners would be expected to produce equivalent emission reductions from the units.

Emissions Reduction

- Statewide in Pennsylvania, 1990 total VOC emissions from solvent cleaning were estimated to be approximately 65 tons per day (this has not been translated to the OTR).
- Reduction of the volatility from 0.3-mm Hg to 0.1-mm Hg could result in an emission reduction of approximately 35-40 tons VOC per day in Pennsylvania.
- The number of facilities that would be affected by volatility limits is directly proportional to population density. Emission reductions from the strategies will be greatest in the urban areas where VOC emission reductions can have a more significant impact on urban ozone and HAP air quality.

Implementation

- The emission reduction program, although tightly tied to pollution prevention concepts, can best be implemented through a regulatory program.
- Because the industry is widespread geographically and made up primarily of small business operations, public outreach is an extremely important part of implementation efforts.
- The solvent cleaner hardware and equipment technology materials are readily available and cost effective from a capital payback perspective.
- This initiative is based on readily available materials and technology. The measure is cost effective and, in the long run, cost beneficial for affected facilities.

Emission Reduction Measure #7

Nonroad Vehicles and Equipment

As a general category, nonroad vehicles and equipment includes three subcategories: Diesel Land-Based (construction, agricultural, and locomotives); Diesel Marine (ocean going vessels and tugs); and, Gasoline Nonroad Equipment (lawn and garden, and recreational equipment). Diesel engines are major contributors of NOx and PM. The major emission from gasoline engines are VOCs and, to a lesser extent, NOx. Construction equipment emits the majority of regional nonroad NOx emissions and is a large contributor of VOCs.

Control Options

This discussion covers a wide range of options for nonroad emission sources. Many of the control approaches used to date will provide long-term NOx and VOC emission reductions (i.e. nonroad SI and CI engine standards). Low sulfur gasoline and diesel can provide important short-term emission reductions. Emission control retrofit of diesel (CI) engines is an available option for reducing engine emissions.

Construction Equipment NOx Reductions:

- The use of Selective Catalytic Reduction (SCR) devices can yield a 70% NOx reduction.
- Fuel changes such as use of fuel emulsion can yield 10-30% NOx reduction. Increased cetane levels can yield approximately 5% NOx reduction and reformulated diesel fuel can yield 8% NOx reduction.
- Blue Sky engines are certified to 50% of the emissions (NOx and VOCs) of their conventional counterparts.

Marine Diesel and Locomotive Engines:

- SCR and emulsion to reduce NOx emissions
- IMO regulations to reduce ocean going vessel emissions
- Market incentives (variable port fees)
- State options to affect in-use locomotive regulation

Gasoline Nonroad (spark ignited (SI)) Engines:

- Adopt California standards for small SI engines
- Implement buy back programs
- Introduce market incentives to encourage the purchase of cleaner engines

Available Retrofit Technologies for VOCs

- Diesel oxidation catalyst (DOC)
- Diesel particulate filters (DPF)
- Enhanced combustion modifications (e.g. cams, coatings)
- Biodiesel and alternative fuels (combined with catalysts)
- Fuel borne catalysts combined with exhaust emission controls

Available Retrofit Technologies for NOx

- SCR
- Systems strategies (combustion modifications combined with exhaust controls)

Recreational Marine Vessels

- Promote use of new engine technologies (also more fuel efficient) through engine buyback programs, differential registration fees, or voluntary State programs.

Emissions Reduction

- Retrofit technologies can achieve greater than 90% emission reductions (DOC and DPF can reduce VOCs by >90%, SCR can reduce NOx by >90% and VOCs by >70%).
- Emissions reductions from nonroad equipment have not kept pace with the onroad engine counterparts. Many nonroad categories have increasing NOx and/or VOC emissions between 1990 to 2007. During this same period, onroad emissions will be reduced dramatically.

Implementation

- There has been experience with retrofit programs in the northeast (USEPA urban bus retrofit/rebuild program, Boston central artery/tunnel project retrofit program, and New York City urban bus retrofit demonstration program) as well as other areas of the U.S. and other countries. USEPA recently announced its voluntary retrofit program for SIP credits from onroad and nonroad retrofits.
- Significant engine orders are needed for manufacturers to produce low emission engines under the Blue Sky approach. States could incorporate Blue Sky engines into purchasing requirements.
- Reformulated fuels and additives are available and costs vary (improved cetane at 1 cent/gallon, emulsion at 10 cents/gallon - due to additional fuel cost).
- Low sulfur diesel fuel enables catalyst-based exhaust control technology to be optimized for emissions reductions (SCR technology is estimated at approximately $15,000 per unit plus cost of urea).
- Improved engine efficiencies (i.e. more fuel efficient marine engines) can offset higher cost of these engines.
- States are pre-empted from regulating standards for some categories (farm equipment and locomotives).
- None of the technologies or options are mutually exclusive.

Emission Reduction Measure #8

Airports/Aviation Industry

Emissions associated with aviation can generally be grouped into the following three categories:

- aircraft emissions: reduced engine taxi, reduced reverse thruster use, derated takeoff power, etc.;
- emissions from ground service equipment (GSE); and
- emissions from auxiliary power unit (APU) operations.

Control Option

Emission standards for aircraft engines are set through an international standard setting process in which FAA is the lead agency for the U.S. with the EPA operating in an advisory role. There are several options for the for the various sources that merit consideration:

- Aircraft Emissions: States can establish differential landing fees based on level of emissions. The more an aircraft engine emits, the more that airline would pay to use the airport. Emissions levels would be established through engine certification and/or aircraft emissions estimates. The overall system would be designed to be revenue neutral.
- Airport Emissions "Cap and Trade": Sets a budget for airport operations and allocates that budget between the major industry at the airport.
- GSE and/or APU requirements: Emission requirements for purchasing of new and rebuilt equipment.

Emissions Reduction

- Additional scrutiny of emissions associated with aviation is yielding better information that can be used to estimate potential emission benefits.
- Emissions associated with aviation travel (NOx, VOC, etc) are projected to increase significantly at airports (14%-36% at airports in the OTR) over at least the next decade. It is important to note that airport emissions are often located in or near major metropolitan areas where air pollution problems have been the most persistent.

Implementation

- Logan Airport in Boston, MA, is testing a differential landing fee program. This program has been used successfully in Europe and has resulted in airlines purchasing and operating cleaner engines employing dual combustor technology.
- An airport emission "cap and trade" program (being explored by the Center for Clean Air Policy (CCAP)) and is part of the options being investigated in an FAA/EPA dialogue with stakeholders.
- The airline industry is particularly receptive to reducing fuel usage as it is a major cost in their operations.

Emission Reduction Measure #9

Distributed Generation/Diesel Generators

The restructured electric power industry raises both opportunities and challenges for air quality regulators. State air agencies will have opportunities to foster and promote new, clean power generation including power from: wind and solar facilities, fuel cells, microturbines, and natural gas combined cycle plants. On the other hand, air agencies may be challenged to control the growth of emissions from small, new sources. In the restructured power industry, small new sources are frequently termed "distributed generation" (DG). Distributed generation can be low emitting sources such as fuel cells or high emitting ("dirty") sources such as diesel engines.

Control Option

State or regional programs to promote or smooth adoption of "clean" DG sources (fuel cell, microturbines, etc.):

- Develop a State certification program for clean DG. For example, States might require that fuel cell or microturbine manufacturers certify their equipment operates below rigorous emission standards. Emission standards could be set regionally.
- Simplify/expedite the permitting of small, clean generating technologies.
- Provide State funding, low cost loans or other incentive programs to companies who install and use clean generating technologies.
- Collaborate with State public utility commissions to develop interconnection standards that ease or promote market penetration of clean generating technologies.

State or regional programs to ensure diesel engines do not cause emission increases in electric power sector:

- Develop a State certification program for dirty DG. For example, States might require that diesel generator manufacturers certify that their equipment operates below rigorous emission standards. Emission standards could be set regionally.
- Alternatively, develop regional standards for permitting diesel generator sets (the engine and generator). The new standards might include standards for: what size unit must be air permitted; emission standards for NO_x, SO_2, and PM; fuel requirements; control equipment requirements; etc.

Emissions Reduction

- In recent tests, NO_x emissions from stationary diesel engines ranged between about 11 to 45 pounds of NO_x per megawatt hour of electricity produced (lbs/MWh).
- Many electric generating units subject to Phase II of the OTC NO_x MOU achieve a NO_x emission rate of about 3 lbs of NOx/MWh. Stationary diesel engines emit about 3.7 to 15 times more NO_x emissions than these sources.
- Improved engines, improved fuels and "end of pipe" controls can greatly reduce emissions from diesel engines.
- This measure will produce reductions in VOC, NO_x, SO_2, PM, and toxic emissions.

Implementation

- States will need to evaluate their policies and procedures and possibly amend their regulations to ensure: 1) clean DG can be successful in the small power market and 2) diesel engines do not cause increased emissions from the power sector.
- States may not have adequate staff to review permit applications from DG sources. This may necessitate a "certification program" approach to regulating these sources.
- States will need to determine mechanisms to incorporate this option into their SIPs.

Emission Reduction Measure #10

Generation Performance Standards

Generation Performance Standards (GPS), as defined in the 1999 NESCAUM model rule, are output based emissions standards. They are applied to electricity sold to retail customers in a particular state. GPS do not apply to specific generating units or wholesale transactions.

Control Option

GPS or EPS (Environmental Performance Standards) offer additional opportunities to address NO_x, SO_x, CO_2 , and mercury emissions in the period beyond 2003. GPS/EPS can:

- Encourage the development of low emitting and renewable electricity generators.
- Replace fossil fuel fired generation with cleaner generation, resulting in local, regional and national emission reductions of multiple pollutants.
- Provide links with other state and regional efforts to promote clean generation, renewable energy, and efficiency/conservation.

Emissions Reduction

- Standards are applied on an annual basis and recognize trading programs. NO_x reductions will lower non-ozone season concentrations by 25-40% (assuming typical selective catalytic and non-catalytic reduction SCR/SNCR control levels).
- Emissions standards can be revised over time to take advantage of new state, regional or national initiatives.
- As electricity use increases over time, GPS levels can be reduced even if no further NO_x or SO_x control measures are adopted. With each five-year calibration, emissions standards would be reduced by 7-10%.

Implementation

- Connecticut and Massachusetts are expected to adopt Generation Performance Standards in the year 2000. Massachusetts is working toward a 2003 implementation date while Connecticut needs to partner with a combination of several OTC states or one larger state to facilitate enforcement.
- EPA output based emissions workgroup recommends NO_x standards at 1.5 lb/MWh for new and modified fossil units.
- Initial NO_x and SO_x standards would be the same as the OTC MOU phase III standards and the EPA phase II acid rain standards, respectively. Standards for CO_2 reflect Kyoto targets. Mercury standards await data collection and analysis including EPA's Information Collection Request (ICR). A regional GPS could recognize the mercury targets identified in the New England Govenor's/Eastern Canadian Premier's MOU.
- Additional costs are related to program administration and regional information system development.
- While emission reductions can be achieved in the 2005-2007 time frame, benefits can be expected to increase in the long term.

Emission Reduction Measure #11

Systems Benefits Charges

Systems benefits charges [or societal benefits charges, both abbreviated SBC] are fees on customer electricity bills that are designed to fund energy conservation and efficiency programs. The level, type, and scope of SBC varies slightly among OTC states.

Control Option

SBC programs provide for the following:

- Programs are aligned to be area specific; including commercial, industrial, residential, municipal/state, low income, and R/D sectors.
- Funding can be directed at promotion of technologies that are currently, or will soon be available in the market such as equipment, appliances, and building design.
- The level, type and scope of SBC varies slightly among OTC states. Oversight of SBC programs is provided by a board comprised of several stakeholder groups, including State environmental and energy regulatory agencies.

Emissions Reduction

- SBC and technology funds offer opportunities to generate substantial new power, replacing older and dirtier fossil units.
- A specific portion of the State's NOx budget can be set-aside [typically 3-5%] to promote the development of efficiency and renewable energy measures. Both NY and MA already have programs in place, while other States are considering implementing similar measures.
- SBC programs are anticipated to provide many opportunities for emission reductions in the years beyond 2001.

Implementation

- SBC programs are managed by the wires companies that will be providing electricity to their customers. State boards have reviewed and approved the wires companies plans for allocation of the SBC funds and will be actively involved.
- In States where restructuring acts have provided for separate new technologies based fund there are important linkages between SBC and these technology efforts.
- Technology funds help manage risk during the initial testing and application of equipment or energy efficient innovations. Once demonstrated, such technology can be moved into the mainstream through SBC efforts.
- States will need to evaluate their own policies and procedures and perhaps even amend their regulations in order to remove barriers that impede implementation of renewables, efficiency measures, and clean power generation.
- Appropriate metrics need to be developed to assure that efficiency measures, new technology, or improved building design truly have a positive environmental effect.
- While emission reductions can be achieved in the 2005-2007 timeframe, benefits can be expected to increase in the long term.

Emission Reduction Measure #12

Energy Efficiency and Energy Conservation

Energy Efficiency and Energy Conservation concepts reduce energy-input requirements and demand for electricity. System Benefit Charge (SBC) funded programs promote markets for energy efficiency services and present opportunities for NOx and VOC reductions in the OTR.

Control Option

Initiatives can be promoted by the following methods:

- Pursue SIP credits for energy efficiency measures.
- OTC Commissioners can continue to encourage energy efficiency practices in individual state policies, especially for SBC-funded programs.

Emissions Reduction

- Power generation in the OTC accounts for approximately 3900 tpd of NOx.
- As an example, new home construction in the OTR could provide an opportunity for NOx reductions of approximately 0.5 tpd, if the homes were constructed to meet the International Energy Conservation Code (IECC). Adherence to the code for these and other types of buildings could be encouraged through SBC-funded programs.

Implementation

- Connecticut, Delaware, Maine, New Jersey, New York and Pennsylvania have programs that either fund or will fund energy efficiency programs.
- Texas has submitted a draft ozone SIP that would provide a NOx credit for the Dallas-Fort Worth Area for energy conservation measures. EPA has not yet issued a response to the proposal.
- Determine if the Texas proposal would be helpful for OTC states.
- Quantify actual NOx reductions resulting from energy efficiency programs. A possible starting point for this process would be to analyze data in the year 2000 quarterly reports submitted to the Connecticut Energy Conservation Management Board.
- Allow emission reduction credits for energy efficiency programs.
- Enhance the effectiveness of SBC programs by encouraging expansion into opportunities to leverage additional funding sources, such as venture capitalists.
- While emission reductions can be achieved in the 2005-2007 timeframe, benefits can be expected to increase in the long term.

Emission Reduction Measure #13

Renewable Energy Sources

Renewable Energy Sources employ clean power technologies to generate electricity. System Benefit Charge (SBC) funded programs promote the use of these sources and present opportunities for NOx and VOC reductions in the OTR by allowing older technologies to be replaced by cleaner power generation sources.

Control Option

The use of NOx reducing renewable energy technologies in individual state policies can be encouraged as follows:

- OTC Commissioners serving on state electrical restructuring boards can encourage allocation of SBC funds.
- The OTC can coordinate with states to determine if their policies and procedures contain barriers that preclude or discourage implementation of renewable sources.

Emissions Reduction

- Power generation in the OTC accounts for approximately 3900 tpd of NOx.
- Several OTC states have implemented renewable energy programs as a result of restructuring legislation. These programs provide an opportunity for approximately 20 tpd of NOx reductions by the year 2005.
- Reductions in other pollutants, such as SO2, occur as an additional benefit.

Implementation

- Connecticut, Maine, Massachusetts, New Jersey, New York, and Pennsylvania have programs that either fund or will fund renewable energy programs.
- New York has partially funded two wind projects through SBC funds. The projects, scheduled to be operational by this summer, provide approximately 17 MW of new capacity.
- Explore avenues to further define links between air quality objectives and renewable energy sources, such as:
  - Quantify actual NOx reductions resulting from renewable energy programs through measurement and verification.
  - Address methods to encourage emission reduction credit (ERC) ownership by renewable energy sources in banking and trading programs.
  - Determine how increasing electricity sales may pressure state NOx budgets if electricity is generated by older power sources.
- Enhance the effectiveness of SBC programs by encouraging expansion into opportunities to leverage additional funding sources, such as venture capitalists.
- Determine if tie-ins can be established with successful non-SBC funded projects. For example, a privately funded wind turbine project in Pennsylvania is now generating power (130 kW) for 25 businesses in Philadelphia.
- While emission reductions can be achieved in the 2005-2007 timeframe, benefits can be expected to increase in the long term.

Emission Reduction Measure #14

State Initiatives

There are a variety of state and interstate programs or initiatives that can be implemented to promote environmental responsibility, energy efficiency, renewable energy, and "clean power".

Control Options

Information Sharing:

- Information related to emerging, energy-initiative, and pollution prevention technologies can be shared amongst stakeholders and different levels of government. Most states are already using the internet to distribute information. *Tech Notes,* developed by Pennsylvania's DEP Office of Pollution Prevention and Compliance Assistance, regularly features pollution prevention and energy efficiency articles concerning the care of land, air, water resources, and energy saving practices for businesses, technology developers, vendors, and end-users.

Interstate Technology Verification:

- To simplify the introduction of new environmental technologies across state borders, Pennsylvania, California, Illinois, Massachusetts, New York, and New Jersey developed a three-tiered approach to review and evaluate new environmental technologies for uniform acceptance of testing and performance data. The three-tier process (known as the *Six-State MOU*) incorporates pollution prevention and recycling, control, remediation, and measurement technologies.

Recognition for Environmental Excellence:

- Award programs for environmental excellence recognize the steps businesses, local governments, and individuals can take to eliminate pollution. New Jersey and Pennsylvania already have such programs. Winners in Pennsylvania alone have eliminated 2.8 billion pounds of pollution - hazardous and residual wastes, air pollution and wastewater - at a savings of more than $9.7 million in annual costs and $1.8 million in capital costs.

"Green" Government Council:

- A government council reviews government building and procurement practices as they relate to energy consumption and material or product selection based on high-performance and sustainability. A panel or "green" team within each agency focuses on integrating issues such as higher ceilings, glare-free lighting, individual temperature control, maximization of natural illumination and, minimization of volatile organic compounds.

Participation in National Programs and Development of Grants for Environmental Technology:

- Implementation of national programs such as DOE's Industries of the Future and the EPA's Strategic Goals for Metal Finishers include commitments by industry to go beyond compliance and commitments by regulators. The program evaluates regulatory, design, permitting, compliance and pollution prevention efforts. The inclusion of national agencies and associations is intended to bring widespread acceptance of verification data and better assistance to participating vendors in marketing their products.

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ORIG. DUE DATE:

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CORRES. DATE: 02/25/2000
RECEIVED DATE: 02/29/2000
ASSIGNED DATE: 02/29/2000
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FROM: SEIF JAMES
ORG: PA DEPT. OF ENVIRONMENTAL PROTECTION; PA DEP
SALUTATION:
CONSTITUENT:

TO: CAMPBELL/BRADLEY M.
TO ORG: REGIONAL ADMINISTRATOR
SUBJECT: NOTICE OF PROPOSED RULEMAKING

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Air Protection Division (3AP21)

ASSIGNED: AIR PROTECTION DIVISION

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